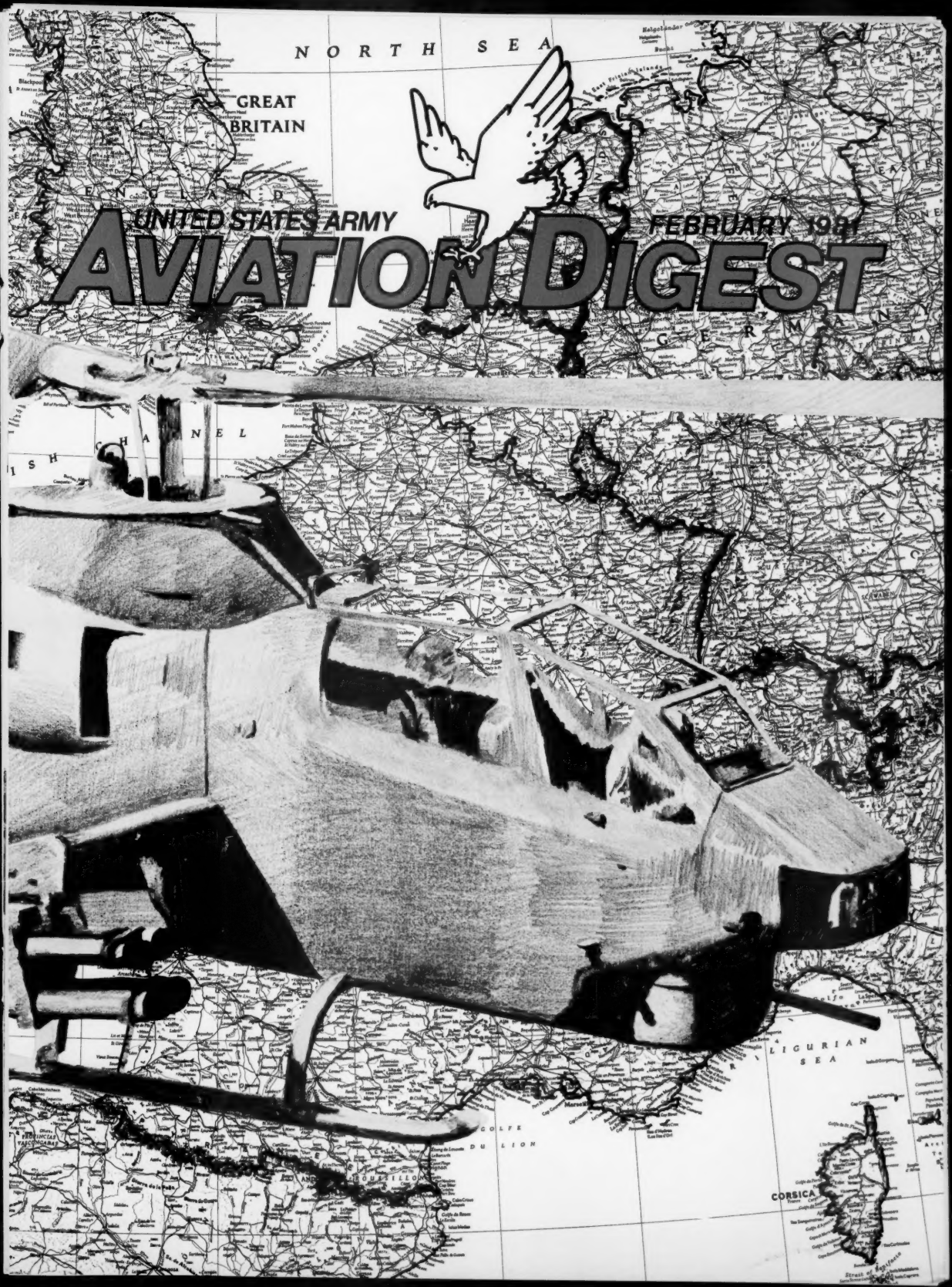

NORTH SEA
GREAT BRITAIN
ENGLAND
CHANNEL
GERMANY
LIGURIAN SEA
GOLFE DU LION
CORSICA
UNITED STATES ARMY
FEBRUARY 1981
AVIATION DIGEST

FEBRUARY 1981 • VOLUME 27 • NUMBER 2

★
Brigadier General Richard D. Kenyon
Army Aviation Officer
ODCSOPS, Headquarters,
Department of the Army

★★
Major General Carl H. McNair Jr.
Commander
U.S. Army Aviation Center
Fort Rucker, Alabama

page 14

page 24

2 USAREUR Aviation — Meeting The Challenges Of The 1980s, GEN Frederick J. Kroesen
4 V Corps Aviation Participation in Spearpoint '80, LTG Willard W. Scott and COL Jessie E. Stewart
7 Jayhawk Aviation, LTG Julius W. Becton Jr. and SFC Edgar A. Thompson
10 I² SOTAS, LTC Robert J. Chiota
14 Dustoff Europe, SP5 Monica L. Burnham
17 PEARL'S
20 Fatigue In Aviation Operations, CPT Michael R. McCoy
23 Hangar Talk — Meteorology (FM 1-30), CW2 Gary R. Weiland
24 Dragoon Air Cav Fight, LTC Jon C. Stillman
27 Reporting Final
30 DES Report To The Field: Anatomy Of The Midair
32 Views From Readers
33 Threat: The Warsaw Pact: 6'6" And Growing, MAJ Forrest D. Williams
36 Know Your Aviators, Constance S. Gibson
38 Hello Dolly, G. T. Gosling and Arnold Mosblech
40 Experience, CW2 T. Cowart
41 Caffeine, COL Richard B. Pilmer
46 Last Liaison Pilot Retires, Betty Goodson
48 It's Not Fair; Or Was It?, CW3 Michael Porter

***Inside Back Cover:* ATC Action Line**

***Back Cover:* Cockpit Cactus,** CW3 Robert B. Murphy

***Cover:* In this issue: Army Aviation in Europe—what we have done—what we *can* do—what we *must* prepare to do, to help USAREUR to hold terrain in defense of the West**

Cover by Fred Martin

page 33

page 41

page 46

Richard K. Tierney
Editor

The mission of the ***U.S. Army Aviation Digest (USPS 415-350)*** is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

The ***Digest*** is an official Department of the Army periodical published monthly under the supervision of the Commanding General, U.S. Army Aviation Center. Views expressed herein are not necessarily those of the Department of the Army nor the U.S. Army Aviation Center. Photos are U.S. Army unless otherwise specified. Use of the masculine pronoun is intended to include both genders unless otherwise stated. Material may be reprinted provided credit is given to the ***Digest*** and to the author, unless otherwise indicated.

Articles, photos and items of interest on Army Aviation are invited. Direct communication is authorized to: Editor, ***U.S. Army Aviation Digest,*** P.O. Drawer P, Fort Rucker, AL 36362. Manuscripts returned upon request.

This publication has been approved by The Adjutant General, Headquarters, Department of the Army, 25 April 1980, in accordance with Army Regulation 310-1.

Active Army units receive distribution under the pinpoint distribution system as outlined in AR 310-1. Complete DA Form 12-5 and send directly to CDR, AG Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220. For any change in distribution requirements, initiate a revised DA Form 12-5.

National Guard and Army Reserve units under pinpoint distribution also should submit DA Form 12-5. Other National Guard units should submit requests through their state adjutant general.

Those not eligible for official distribution or who desire personal copies of the ***Digest*** can order the magazine from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Annual subscription rates are $20.00 domestic and $25.00 overseas.

No one will enjoy the excellent articles in this issue on Army Aviation elements in Europe more than I have. They represent a comprehensive look at the USAREUR aviation mission by the service commanders in the theater — those charged with the key responsibility for planning, preparation and execution of the European defense plan. Never before in a single issue of the *Digest* have the pulses been as significant as those herein. But rightfully so because Army Aviation plays such a key role in the USAREUR, both today in a peacetime and training scenario but, more importantly, in the scheme of maneuver should our forces be called to fight.

The European articles are introduced by General Frederick J. Kroesen in "USAREUR Aviation—Meeting the Challenges of the 1980s," in which he speaks about some needs he believes have to be fulfilled if we are to be able to successfully cope with those challenges. A most thought provoking article which rallies each of us"... to improve the opportunities and capabilities offered by the third dimension."

Specifics on Army Aviation units in V Corps are provided by Lieutenant General Willard W. Scott and Colonel Jessie E. Stewart with some very interesting highlights on "Spearpoint '80" and lessons learned. The 12th Aviation Group's initiatives in the area of interoperability are particularly noteworthy. Lieutenant General Julius W. Becton Jr. and Sergeant First Class Edgar A. Thompson report directly from "Jayhawk Country." Their narrative of the progress made in the implementation of ARCSA III in the 11th Aviation Group (Combat) and the VII Corps divisions should certainly stimulate those units yet to make the ARCSA III transition. Beyond this, however, they provide an excellent insight as to the depth of aviation training and operations in the corps—and even off-continent in the UK. It is reassuring to read of the diligent efforts made by these key units to maintain their state of readiness.

A very important area of service in USAREUR is described in "Dustoff Europe," an outstanding article by Specialist Five Monica L. Burnham. It describes in detail the medical evacuation and support missions flown by the 421st Medical Company (Air Ambulance) which is based in Nellingen, Germany, and is a part of the 7th Medical Command, VII Corps.

To win battles, we must have sophisticated command and control and intelligence gathering equipment such as Lieutenant Colonel Robert J. Chiota reports on in "I² SOTAS." That is the Interim-Interim version of the Standoff Target Acquisition System; and the author tells us of the results achieved when the 3d Armored Division SOTAS was placed OPCON to the 3d Infantry Division, VII Corps, for use in Exercise Certain Rampart 80 in Central Bavaria. This provided both forces, the 1st Armored Division and the 3d ID, with a similar capability. As observed during the exercise, he states that SOTAS provides "the ground commander with the most accurate and timely intelligence flow ever displayed on the battlefield."

In Europe or wherever there is Army Aviation there is a continuing and demanding need for safety awareness. For any of you aviators who have wondered "how it could have happened to you," you may need to take up gardening and plant a cactus or two in the cockpit. Chief Warrant Officer, CW3, Robert B. Murphy tells you how in his message on the back cover, "Cockpit Cactus." It should prick your safety consciousness.

Bidding farewell to a faithful friend and stalwart supporter of our Army and Army Aviation is never easy, but we have that task this month as Major General James C. Smith, director of training, Office of the Deputy Chief of Staff for Operations and Plans, Department of the Army, retires and departs the ranks of active aviators. General Smith is the last remaining active duty Army aviator who began his career as an "L" pilot, and there is no way to summarize adequately his many years of dedicated service in so many positions of key responsibility across our Army. We pay special tribute to him in this issue and suffice it to say that he will be missed by all who wear the wings of silver and "strive for excellence."

Major General Carl H. McNair Jr.
Commander, U.S. Army Aviation Center
Fort Rucker, AL

USAREUR AVIATION

MEETING THE CHALLENGES OF THE 80s

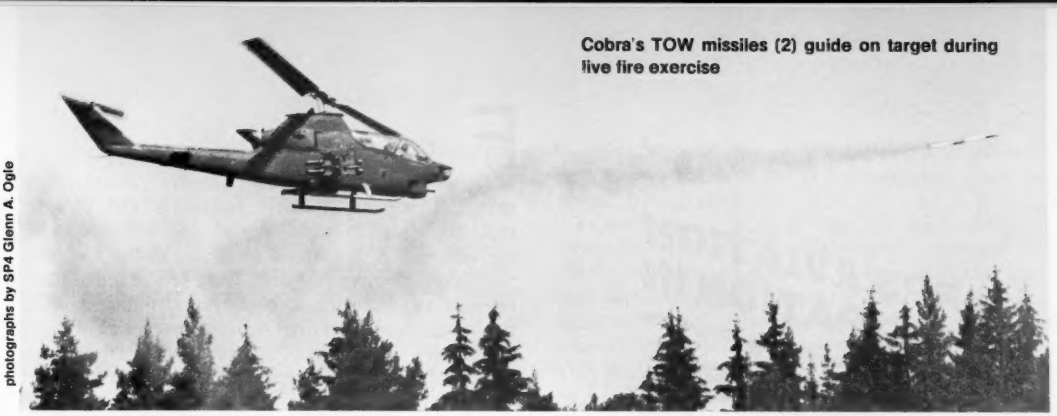
General Frederick J. Kroesen
Commander in Chief
United States Army, Europe and Seventh Army

SINCE THE FRENCH Revolutionary Armies of the 1790s experimented with hot-air balloons, the importance of the third dimension of the battlefield has increased steadily and dramatically. Today the third dimension is probably more important than ever, for if an army cannot control airspace, it cannot hold terrain—and U.S. Army, Europe's (USAREUR's) wartime mission is to hold terrain. In Vietnam we experienced the importance of control of the air, but Vietnam was a war of movement, and even though control of air was decisive in the outcome of many battles, it did not assure ultimate victory. The final victory in that war was achieved because the south failed to hold terrain, in part because the south's air fleet was destroyed on the ground in the wake of the advancing North Vietnamese Army and was not available to provide the assistance promised by an investment in airpower.

The modern European battlefield will be one in which the control of airspace is expected to be hotly contested and in which air and antiair systems will play a crucial role. Given our current technology, it is difficult to conceive of a conventional European battle, a battle that for us will be essentially defensive, in which both fixed and rotary wing aircraft will *not* play a major role. Mobility of the defensive forces will be as necessary as mobility for the aggressor, and the attack helicopter will provide one of the essential force multipliers needed to enable us to fight outnumbered and win. The recent ARCSA (Aviation Requirements for the Combat Structure of the Army) studies recognized these requirements and pointed to the need for more and improved helicopters. It is easy to argue that where helicopters are concerned, more is better.

Today USAREUR is in the early stages of a massive force modernization program. We need to modernize, and I have been quoted freely of late as having said that our equipment in Europe is obsolete. I recognize that every complex product that requires mass production is obsolete in some regard before its full impact can be achieved, but this does not excuse the fact that we have tanks, personnel carriers, artillery and helicopters that are technologically outdated by decades. I recognize too that we have to choose from a myriad of difficult alternatives with regard to force modernization, questioning the cost against the consequences of obsolescence and reconciling wants with needs.

Perhaps the first USAREUR priority for consideration by the Aviation Research and Development



Cobra's TOW missiles (2) guide on target during live fire exercise

photographs by SP4 Glenn A. Ogle

community is the recognition of the need to see. Anyone who has spent more than a few weeks in North Central Europe can attest to the vicissitudes of weather that will impact on any war fought in the region. The cycle of day and night during the long nights of winter provides 14 hours of darkness; smoke and dust, which any war can generate on a grand scale; and fog and rain so common in all of Northern Europe will also reduce visibility. All of these factors will impede the use of airpower in the European battle until we have new technology in the field which allows us to see through them. Succeeding generations of aircraft have improved the pilot's ability to fly in reduced visibility, and, technologically, we expect this trend to continue. The cost is high in terms of dollars, but dollar cost here is outweighed by the benefits of increased availability and versatility of air systems. We need attack units and utility and support aircraft that are all-weather and 24-hour capable if they are to remain effective in Europe.

A second USAREUR need is that of aviation doctrine and training. Greater emphasis is required on the "How" of employing aviation assets, for the tactical employment of helicopters has too long been subordinated to technical measures involved with safety of flight. We need to look more to technology to enhance safety in order to allow us to make better use of the creative and diligent minds that are developing effective tactical doctrine. Safety cannot be overlooked, but the *raison d'etre* of our helicopter force is served only if we become more concerned with its combat role.

USAREUR is a dynamic organization where aviators can find challenge, purpose, professional fulfillment and a clearly defined mission. If we can execute our modernization programs, the contribution and role of aviators will continue to increase.

We have ten attack companies in theater now, and plan to add more in the 1980s. Our medium helicopter and combat support aviation companies will almost double in number within the new few years, and the AH-1S Cobra and the UH-60 Black Hawk will soon be arriving. We are conducting frequent combined exercises with our NATO Allies to add greater challenge to training and greater versatility to the fleet. During last fall's maneuvers in the British exercise "Spearpoint," our 295th Medium Helicopter Company from Coleman Barracks in Mannheim transported more than 10,000 British Soldiers in simulated combat operations. Other realistic training is provided by a program of no-notice gunnery exercises in which our attack helicopter units move from their home stations to the Grafenwoehr training area for a 2-hour shootout in a realistic live-fire test of their ability to locate, identify and engage a simulated enemy armored force. It's expensive, but it's exciting and it is first class training.

Army Aviation has a vital role in plans that affect both the U. S. Army in Europe and the defense of the West. I hope that Army aviators throughout the world will continue to strive to improve the opportunities and capabilities offered by the third dimension and that many of you will want to be part of the day-to-day activities that support and enhance USAREUR's role in deterrence and defense.

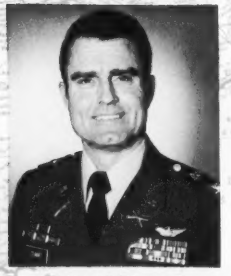
UH-1 Hueys take off to participate in combined NATO exercises

V CORPS AVIATION PARTICIPATION IN Spearpoint '80

Lieutenant General Willard W. Scott
V Corps Commander
U.S. Army, Europe

Colonel Jessie E. Stewart
12th Aviation Group Commander
and V Corps Aviation Officer

General Scott



Colonel Stewart

FLEXIBILITY, responsiveness and reliability are necessary characteristics of a military force engaged in modern warfare. V Corps aviation is ready to meet these challenges in its own or any other sector, working for either U.S. or Allied commanders—efficiently and safely. Our aviation units were privileged to plan, execute and experience these responsibilities during the recent Autumn Forge series of exercises in 1980, but under a unique set of circumstances. There were 210 U.S. helicopters assembled near Hannover, West Germany, in September. Their mission — to operate under control of the 1st British Corps. Employing nap-of-the-earth (NOE) tactics in an unfamiliar area, U.S. pilots flew 5,400 hours with zero mishaps in a 16-day period.

Traditionally during the annual Return of Forces to Germany (REFORGER), V Corps and VII Corps of the United States Army, Europe (USAREUR) alternate responsibilities. One corps participates in a field training exercise (FTX) and the other conducts a command post exercise (CPX). V Corps, during its CPX this time, was given the unique opportunity to participate and experience firsthand interoperability with Allied forces of the Northern Army Group in an exercise called Spearpoint '80. This exercise was the largest British operation on the continent since World War II.

Planning for Spearpoint was a greater challenge than for previous exercises. The extended distances between the exercise area and the aviation units' home stations caused most problems, but varying command and staff techniques between the different nationalities also provided some anxious moments. However, during the planning phase interoperability procedures were developed which later proved highly successful. The resulting benefit from these initial difficulties was that V Corps aviation units were able to deploy with less detailed plans than are traditional for an exercise of this magnitude. Flexibility and general preparedness were therefore given a real test.

Perhaps the greatest challenge was faced by the 12th Combat Aviation Group (CAG) headquarters. A three-battalion task force, placed under the 12th CAG by USAREUR order, was comprised of elements from 14 different organizations — nine with which 12th CAG has no normal peacetime command relationship. In some cases control was chopped en route, and some units were given their precise locations by radio just prior to landing. After assembling, units were briefed, issued maps and sent to work. The 12th CAG indeed validated doctrine that an aviation group headquarters can accept, control and employ several battalions on short notice—anywhere.

Within the 1st British Corps Headquarters, a U.S. Army Air Support Operations Center was established. This center, a compact but well-designed mobile facility,

provided necessary space for operations. The 12th Group commander, his staff operations element, and two coordinating officers from V Corps Aviation Office manned the center. Operating 24 hours a day, they functioned as part of the Exercise Director Headquarters. This control cell became operational only a few hours prior to the arrival of the initial U.S. Army Aviation assets.

Close and continuous coordination with the 1st British Corps was paramount. When forces were chopped from V Corps, an almost perfect integration to the British command occurred. The only rough spots were with some language quirks. One British Soldier remarked that there was a bit of a communication problem with the American version of the "King's English." U.S. aviators also had to do some adjusting. Pilots didn't know at the start that "cleared to join right for the upper third mate," meant in American to "enter right downwind, plan to land long." These minor differences, however, only served to highlight the camaraderie which quickly developed between the British and the American forces and continued throughout the exercise.

During Spearpoint the 8th Combat Aviation Battalion (CAB) was attached to the 2d Armored Division, a REFORGER unit from Ft. Hood, TX. About 40 continental United States (CONUS) based aviators deployed to Europe and also were infused into the 8th CAB. This aviator augmentation may have aided in the excellent tactical support and rapport that quickly developed between a USAREUR combat aviation battalion and a CONUS REFORGER division. The CAB readily responded the instant the division's advance party arrived.

An arrangement with the 1st British Corps also was made which permitted British/U.S. pilot exchange during Spearpoint. This pilot exchange provided each nationality an appreciation for the other's tactics and procedures. This type of exchange could prove very beneficial in a wartime situation when familiarization with the area of operation is limited.

The 295th Aviation Company, augmented by six Chinook helicopters from the 205th Aviation Company (CH-47), was under operational control of the "Disruption" Brigade (opposition forces). The disruption brigade (a composite U.S./British force under the command of the 2d Brigade, 82d Airborne Division) was designed to simulate the Warsaw Pact airmobile threat. These tactics highlighted the tremendous versatility of the CH-47. During the exercise the CH-47's flew 11,219 troops and hauled 2,590 tons of cargo. This task was accomplished while operating and maintaining the aircraft under actual field conditions. The unit had to ensure that 18 CH-47s were available on a daily basis throughout the period of the exercise. This was done with 24 Chinooks flying about 800 hours during a 16-day period. Maintenance actually improved in spite of a 300 percent surge over the normal flying rate.

From a tactical point of view, the most important aspect of employing the 295th was the ability of the CH-47s to make raids deep into the opposition's territory and deposit large numbers of combat troops and equipment rapidly. Umpires reported that the winding and twisting NOE flights, operating in groups of two or three aircraft, simply could not have been detected by fixed wing fighter aircraft. Raids by CH-47 transported units were conducted as far as 80 miles into enemy territory and subjected the opposition forces, regardless of location, to the threat of an airmobile attack.

Elements of the 59th Air Traffic Control Battalion, a USAREUR asset, were assigned to the 12th Group commander for air traffic control. The 250 plus helicopters operating within the exercise area were supplied with effective flight following, weather briefings and rapid dissemination of urgent aeronautical information. This unit played a vital role in flight and ground movement safety. More than 12,000 movements of aircraft were controlled at Hildesheim during the exercise without a single incident. Their planning and operating procedures were a tremendous success.

As in all successful training exercises, participants at all levels learned new methods for accomplishing old tasks and were able to perfect procedures that had worked well in the past. One of the more significant lessons learned included a definite need for a new NATO (North Atlantic Treaty Organization) standardized map for tactical helicopter operations. During past major FTXs, USAREUR aviators participating in tactical play were required to remain within 150 feet of ground level and were issued 1:50,000 wire hazard maps. These maps proved too large and difficult to handle in the cockpit. This large-scale map was easy to navigate from, but covered only a small area. "Flying off" the map happened often. These disadvantages have been accepted by pilots because the only alternative was the 1:250,000 Allied Forces Central Europe low flying chart whose small scale does not provide sufficient detail for contour and NOE flying. The British Army of the Rhine provided a better alternative during Spearpoint '80. The map was actually 1:50,000 maps put together and reduced to 1:100,000 scale. Using this method, a single sheet, printed front and back, depicted the entire 40 by 90 km maneuver area without the loss of detailed information. The British special map was clearly superior to the U.S. provided wire hazard maps and was almost universally employed by U.S. pilots even though they were not standard issue to our pilots. In reaction to the positive acceptance of the British map, the 12th CAG commander directed his staff to ask participating aviators

to assess the map's pilot acceptance and effectiveness. The survey results confirmed initial impressions that the 1:100,000 scale map was the preferred size. The after-action report recommended that a study be made to determine the feasibility of making this scale map available for U.S. Army tactical helicopter navigation.

Training with other NATO forces and out-of-sector operations are always prime methods of enhancing our combat effectiveness. Working with the British provided V Corps aviators an outstanding opportunity to experience Allied procedures and operations. Exchanging new techniques with the British, fine tuning of contingency plans, and perfecting implementation of NATO Standardization Agreements all combined to greatly improve the overall Allied combat readiness.

Intensively managed and task organized, all aviation units provided flexible, responsive and reliable aviation support while maintaining an unblemished safety record.

CH-47s of the 295th Aviation Company lift 44 British combat troops and a land rover into a landing zone in Northern Germany during REFORGER 1980 exercise Spearpoint

JAYHAWK AVIATION

Lieutenant General Julius W. Becton Jr.
VII Corps Commander
U.S. Army, Europe

Sergeant First Class Edgar A. Thompson
Operations Sergeant
VII Corps Staff Aviation Office

General Becton

Sergeant Thompson

THE UNITED STATES Army's VII Corps exists for only one reason; "To be prepared at all times to go to war; to fight; and to win!" This is no easy task in itself considering that the VII Corps area of responsibility is spread out over a 30,000 square mile area of the southern part of Germany, making it the largest corps area in the United States Army. Bordered by four other countries including Warsaw Pact nations East Germany and Czechoslovakia and with about 70,000 military personnel, the corps is charged with the responsibility of ensuring that the defensive posture of the VII Corps area is maintained under the general defense plan of the NATO Command in Western Europe.

Army Aviation plays a vital role in the defense of Western Europe today and nowhere is it more apparent than in "Jayhawk Country." Strategically deployed throughout the VII Corps area to provide combat aviation support when and if the need arises are the following aviation elements:

- The 501st Aviation Battalion (Combat) of the 1st Armored Division is located at Ansbach, Germany. The 3d Aviation Battalion (Combat) of the 3d Infantry Division is headquartered at Kitzingen. Both combat aviation battalions of the divisions are comprised of two attack helicopter companies each, one combat support aviation company, a general support aviation company and an aviation unit maintenance (AVUM) company.
- The Air Cavalry Attack Troop and the Air Cavalry Support Troop of the 2d Armored Cavalry Regiment are headquartered in Nuernberg, Germany. In addition to its routine aviation training and support requirements, the 2d Armored Cavalry Regiment is tasked to provide a 365-day-a-year "real world" mission of airborne surveillance of a 420-mile stretch of the East German and Czechoslovakian border, a vital role in the defensive network of NATO.

In addition, the forward element of the famous "Big Red One" 1st Infantry Division has a traditional brigade aviation section stationed at Goeppingen.

• The 394th Aviation Intermediate Maintenance (AVIM) Battalion located at Nellingen, Germany is part of the Corps 2d Support Command and provides direct/general aircraft maintenance support to the more than 425 aircraft assigned to VII Corps subordinate commands.

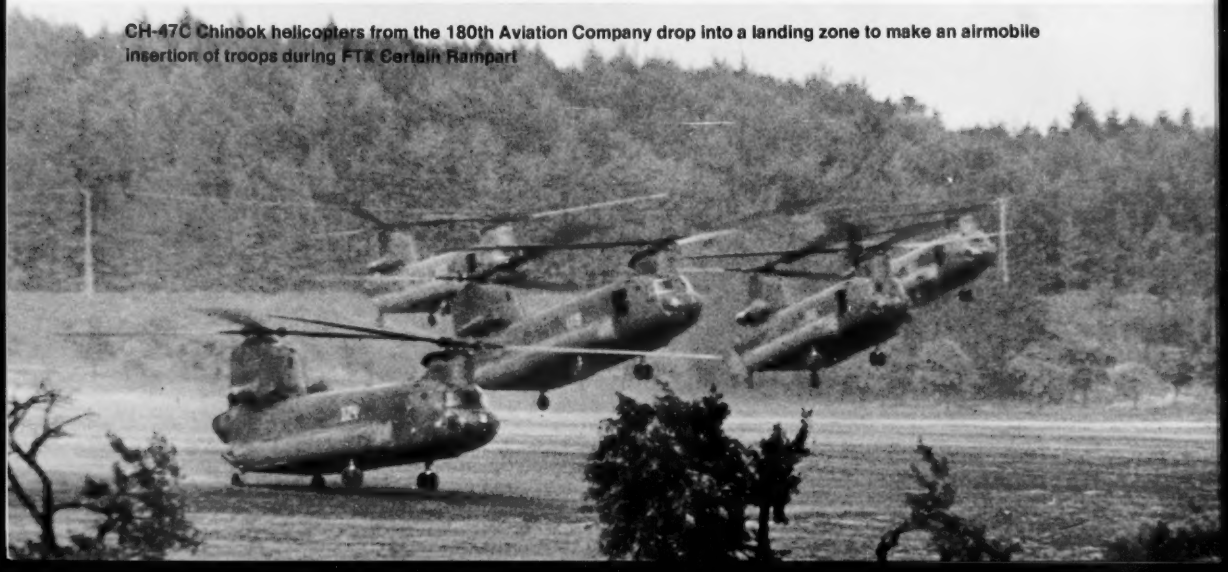
This high volume of complicated aircraft is a far cry from what the old veteran saw in the corps 20 years ago. In those days, divisions had combat commands each with its own aviation section, usually consisting of two OH-13 Sioux helicopters. The total aircraft found within a corps in those days was just a fraction of what is found in an armored or mechanized division today.

In the very early 1960s, the armored cavalry regiment had OH-13, L-19 (O-1 Bird Dog) and a few OV-1A Mohawk aircraft. There wasn't an armed aircraft anywhere. The corps might have had CH-21 Shawnee or CH-34 Choctaw helicopter units for moving cargo or conducting airmobile operations. But it was a far cry from the sophisticated aircraft and weaponry found within the corps aviation units of today.

The most recent addition of aviation assets to the VII Corps family has been the 11th Aviation Group (Combat), which joined the corps from the U.S. Army, Europe (USAREUR) on 17 November 1979. Headquartered in Schwaebisch Hall, Germany, the 11th Group consists of the 223d Aviation Battalion (Combat), with plans calling for the addition of an attack helicopter battalion. Assigned within the 223d Aviation Battalion are the 25th General Support Aviation Company and the 48th Assault Helicopter Company, both located at Echterdingen Army Airfield outside of Stuttgart, and the 180th "Big Windy" (CH-47) Chinook Company situated at Schwaebisch Hall. The addition of the 11th Aviation Group has provided a new dimension to VII Corps' operational capabilities.

This addition was part of a long-range concept to reorganize and upgrade aviation within the Army. Known as ARCSA (Aviation Requirements for the Combat Structure of the Army), the reorganization of the aviation force structure was scheduled in phases over a period of years. ARCSA planning and implementation has solved many of the problems that had traditionally impeded full implementation of Army Aviation capabilities in Europe. ARCSA III implementation within VII Corps will be completed with the addition of a second medium lift helicopter company to the 11th Aviation Group during fiscal year (FY) 1982. Long-range ARCSA planning also will add the attack helicopter battalion to the corps during the mid-1980s. These additions—along with new and modified aircraft systems such as the OH-58C Kiowa (scout); modernization of the CH-47D fleet; the addition of the UH-60A Black Hawk (the 48th Aviation Company of the 11th Aviation Group is scheduled to receive the Black Hawk during FY 1981); and the eventual addition of the advanced attack helicopter (AAH) to the aviation inventory in the mid-1980s—will allow both VII Corps and other USAREUR aviation units to continually improve their aviation capability and attain the goal of complete integration into the combined arms team.

Although aviation units train year-round in Germany with numerous gunnery training exercises and field



CH-47C Chinook helicopters from the 180th Aviation Company drop into a landing zone to make an airmobile insertion of troops during FTX Certain Rampart

training exercises (FTXs), VII Corps aviation units had the opportunity to train and exhibit their wares collectively recently during REFORGER 80. The REFORGER (Return of Forces to Germany) exercise is an annual series of major FTXs focusing on interoperability training among NATO countries which are conducted simultaneously throughout the Federal Republic of Germany. During a 2-week period in September 1980, FTX Certain Rampart was conducted in the VII Corps sector. During the exercise, the VII Corps aviation units logged more than 9,000 hours of tactically oriented flying time. This intensified period of flying resulted in more than 12 percent of the corps' annual flight time requirement being accomplished in a 14-day period.

Valuable training was received by both U. S. Army and U. S. Air Force pilots during FTX Certain Rampart. Army aviators from the 501st Aviation Battalion (Combat), the 3d Aviation Battalion (Combat) and the 2d Armored Cavalry Regiment, flying both the OH-58 Kiowa and AH-1S Cobra TOW (tube-launched, optically-tracked, wire-guided) helicopters, teamed up with Air Force A-10 pilots to fly numerous joint air attack team (JAAT) air missions. JAAT is a combination of Army attack and scout helicopters and the Air Force close air support A-10 aircraft operating together to locate, engage and destroy tanks, armored vehicles and other battlefield targets. The JAAT concept has added a new dimension to the battlefield and provides an outstanding "tank killing" capability available to the ground commander during conventional land warfare.

In addition to the valuable training received during FTX Certain Rampart, VII Corps attack helicopter units make maximum use of the gunnery ranges at Grafenwoehr, Hohenfels and Wildflecken to qualify and sustain their tank killing capabilities. One such sustaining exercise is the Seventh Army Training Command's no-notice aerial gunnery program, where an attack helicopter platoon is alerted to respond from home station to assist another attack helicopter unit in destroying an "aggressor."

During one recent exercise, a platoon from Charlie Company, 501st Aviation Battalion of the 1st Armored Division, flew to Grafenwoehr Army Airfield to reinforce the 503d Aviation Battalion of V Corps' 3d Armored Division. At the same time, CH-47s of the 11th Aviation Group responded to deploy a forward arming and refueling point (FARP) to the Hohenfels training area. The scout and Cobra pilots of C Company, 501st Aviation Battalion were briefed on the tactical situation by the 503d Aviation Battalion and eventually deployed to Hohenfels via a tactical instrument route set up and operated by the 59th Air Traffic Control Battalion. After accomplishment of the mission, the platoon was released and returned to its home station at Illesheim.

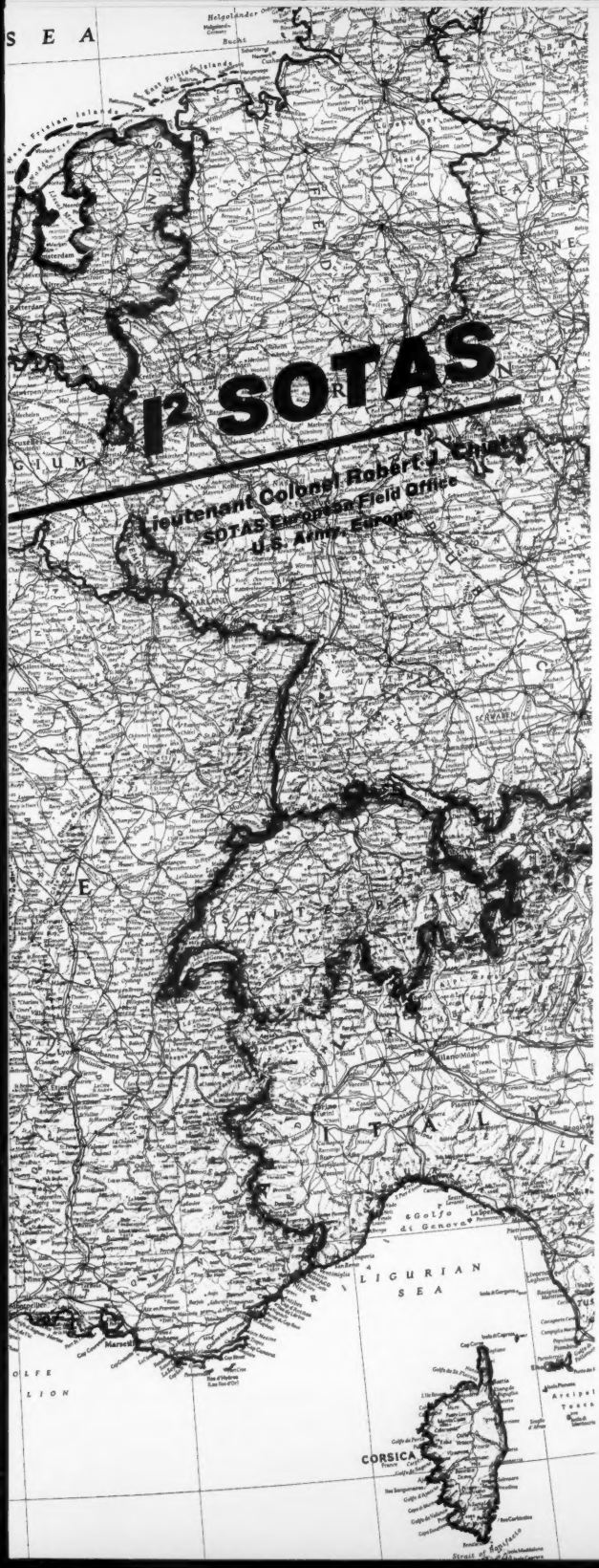
Another example of VII Corps' attack helicopter training is the 2d Armored Cavalry Regiments' Subaltern Squeeze, a weekly exercise to train aviator lieutenants and junior warrant officers. The lieutenant is assigned the mission to "locate and stop an advancing enemy." He is required to lead his attack helicopter section, integrate field artillery and engineer demolition support, direct an M-56 aerial mine-laying team, and coordinate a joint air attack team consisting of A-10s and his Cobra helicopters.

Recently, VII Corps aviation units have expanded their training programs by crossing the English Channel to take advantage of their sister service, the U.S. Air Force, and their NATO Ally, the British Army. Units conduct TOW gunnery, instrument training and Night Hawk/night vision goggle training while on British soil.

VII Corps aviation units participate in an annual interoperability exercise called Albatross, with its partnership unit, the II German Corps. Last spring's Albatross IV saw UH-1H and CH-47 aircraft from VII Corps joining with UH-1D Huey and CH-53 aircraft of II Corps to conduct the largest aviation interoperability exercise to date. The combat readiness of both corps has been enhanced through this continuing series of interoperability exercises. The II German Corps also participated in FTX Certain Rampart, providing four CH-53 aircraft to augment the medium lift capability of the 180th Aviation Company.

During fiscal year 1980 VII Corps aviation units accrued more than 75,000 hours of flight time with an aviation accident rate of only 5.5 per 100,000 flying hours, which is well within the standard established by the Department of the Army.

Much of the success of the VII Corps aviation program must be passed on to the unheralded, behind-the-scenes heroes of Army Aviation — the mechanics; crewchiefs; armament technicians; petroleum, oils and lubricants specialists; and other support personnel who keep the helicopters and airplanes in the air. Because of the dedication and outstanding efforts of these fine men and women, VII Corps aviation units stand ready today to make their contribution toward preserving peace and freedom in Western Europe.



SOTAS HAS BEEN used for the past 3 years supporting every major field exercise conducted in the 7th Army and U.S. Army, Europe (USAREUR) area of interest. But, what is SOTAS?

The acronym for the Standoff Target Acquisition System, SOTAS consists of a moving target indicator (MTI) radar mounted in a modified UH-1H Huey helicopter. A data link from the helicopter transmits moving target information to the ground display station. The ground display station, housed in a van, is configured to receive, process, store and display the MTI data from the airborne radar (figure 1).

SOTAS is a division asset that provides radar coverage of the division area of interest and detects movement, buildup and withdrawal of enemy forces beyond ground line-of-sight. The information is supplied to users in real time. The Interim-Interim (I^2) SOTAS version is so-called because it represents modifications to the advanced development model that was tested in Korea and Europe in 1976. SOTAS has participated in numerous field tests, demonstrations and exercises. With each use, new applications and modifications have been identified for SOTAS.

This article covers the use and results achieved during exercise Certain Rampart 80. The 1st I^2 SOTAS Detachment, commanded by Major Erich Dippel, was assigned to the 3d Armored Division in V Corps. For the exercise it was placed under the operational control of the 3d Infantry Division (Orange Force). Although this marked the first time the 3d Infantry Division worked with SOTAS, an excellent rapport was established immediately. The 2d I^2 SOTAS Detachment under the command of Major Rick Peyton was assigned to the 1st Armored Division (Blue Force) in VII Corps.

The scenario below is provided to better describe and define some of the employment techniques and the results achieved by SOTAS. It is worthy to note that SOTAS is another intelligence gathering vehicle and when combined with the other intelligence flow readily provides the ground commander with the targeting network that allows immediate engagement by all available weapon systems.

"ASIC this is SOTAS. . . ." This phrase began literally hundreds of reports passed between SOTAS and the division all source intelligence center (ASIC) during Exercise Certain Rampart. Part of the Autumn Forge series of exercises in Germany, Certain Rampart took place from 15 to 24 September 1980 in Central Bavaria (figure 2). Although primarily a U.S. VII Corps field training exercise, the participants included troops from Canada, Denmark, France and Germany (figure 3). The exercise began with the Orange Forces penetrating the fictitious international border, shown

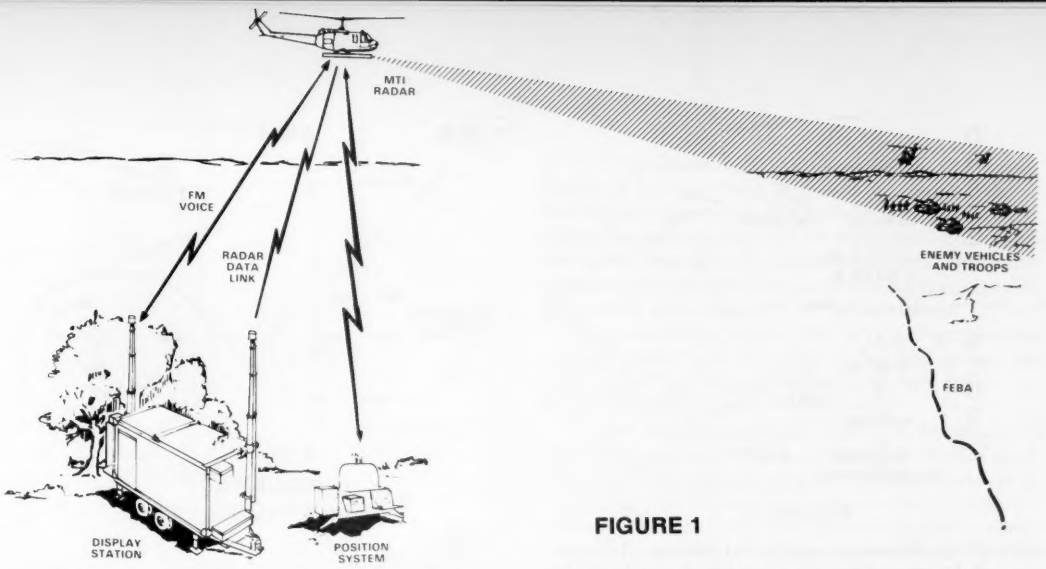


FIGURE 1

as the FEBA (forward edge of the battle area) on figure 2, and attacking south. Their main objective was to secure crossing sites on the Donau (Danube) River and continue the attack south. The exercise was essentially free play, but planners expected that Blue Forces would blunt the attack at the river, counter-attack and restore the international boundary.

Both division commanders recognized the tremendous capability of SOTAS and made significant use of the system during the exercise. The following examples typify the way I² SOTAS was used by those commanders and their staffs during Certain Rampart.

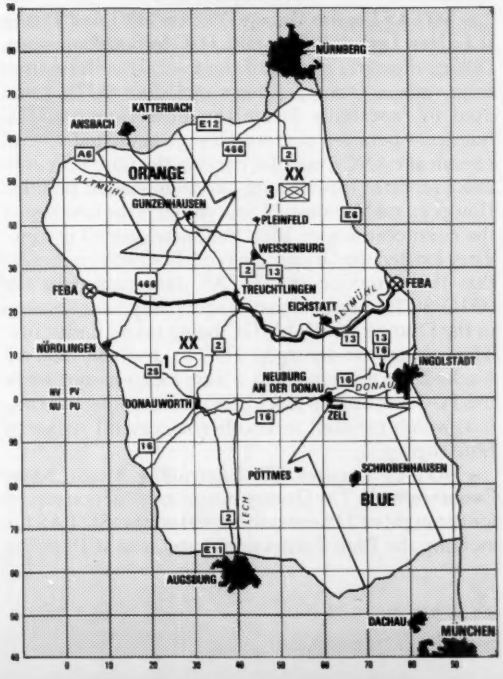
• **SOTAS Locates Second Echelon Reserve Forces.** On Tuesday, 16 September, Blue SOTAS located Orange battalions northwest of Weissenburg—the first indication of the Orange or reserve forces. SOTAS provided the division with important information for maneuver of its forces and targeting information for Air Force close air support missions.

• **SOTAS Locates Command Posts.** Sometimes seemingly minor activity can lead to significant results when pieced together into the intelligence puzzle. On Wednesday, 17 September, Orange SOTAS observed a helicopter flying into an area. Subsequently another helicopter was observed flying out. Continual helicopter flights into and out of the area established a pattern which SOTAS observed and reported to the ASIC. The information was passed on to the fire support element and the target area was engaged by artillery. As a result, Orange Forces were credited with a hit on a Blue Forces brigade command post (figure 4).

• **SOTAS Vectors Night Airmobile Assault.** On the 17th, Orange Forces used SOTAS to direct and track the movement of their helicopters conducting an airmobile assault in reduced visibility. A SOTAS beacon was placed on the lead helicopter to assist in tracking the operation. Direct communication was established between the flight leader and the officer in charge (OIC) of the SOTAS ground station. As a result, the assault force was successfully vectored to the landing zone (LZ). However, as the helicopters were preparing to make their final approach, the SOTAS operators detected movement in the LZ and alerted the lead helicopter to be prepared for possible engagement. The mission had to be aborted when the Orange pathfinders transmitted an emergency message informing the flight leader that they (pathfinders) were about to be captured. The airmobile force returned to home base via vectors provided by SOTAS.

In spite of the abort, the airmobile operation was a success in view of the role SOTAS played. Not only

FIGURE 2



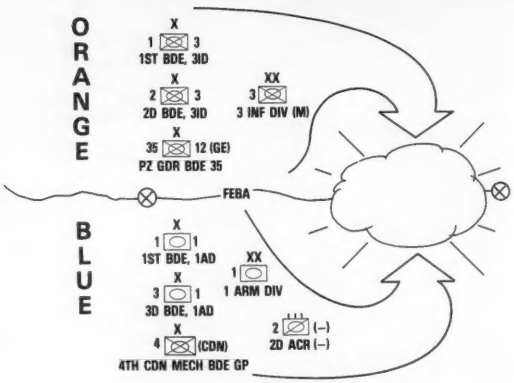


FIGURE 3

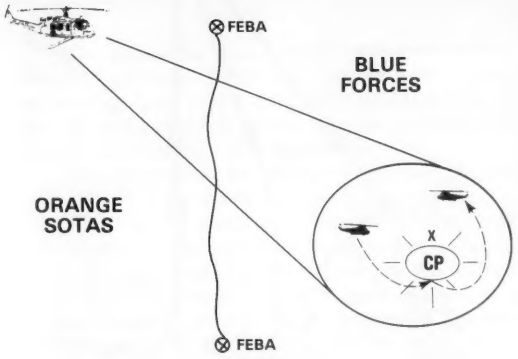


FIGURE 4

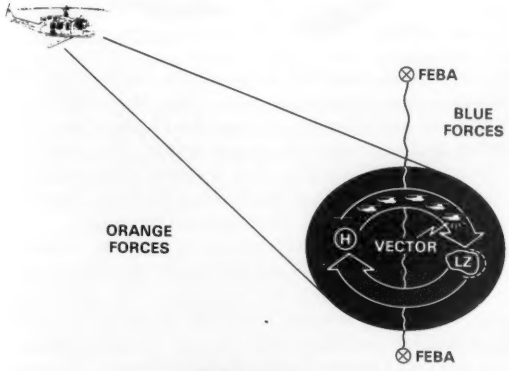


FIGURE 5

did SOTAS eliminate a significant amount of danger and risk by providing radar vectors to and from the LZ, but it also warned the flight of impending danger from enemy ground forces located there (figure 5).

• **SOTAS Locates Blue River Crossings.** On the 18th, Orange SOTAS flew six successful missions totaling nearly 7 hours. Of significant interest during that period was the location of river crossing operations including the destinations of the crossing units. Orange SOTAS observed two Blue river crossings in the vicinity of coordinates PV 6001 (NEUBURG) and PV 6702 (east of NEUBURG). Also, traffic on Highways 2 and 16 was tracked as it merged at Donauworth and headed south (figure 6). Information derived from SOTAS regarding the withdrawing Blue Forces played a key role in Orange planning for their imminent river crossing operations.

• **SOTAS Locates Orange Division TOC And Tracks It To New Location. Blue Hits TOC In Both Locations.** During the early phases of the exercise, information from various Orange sensors including SOTAS was used to repeatedly locate the Blue Division TOC (tactical operation center). Orange launched several chemical LANCE missiles causing the Blue Forces to make repeated trips through decontamination facilities. However, on Monday, 22 September—the first day of the counterattack — Blue Forces retaliated in kind. They located the Orange Division TOC and *confirmed* that the detection by SOTAS data passed to the ASIC. SOTAS targets passed to artillery units resulted in the Orange Division TOC being taken under fire. This caused the damaged TOC to displace. SOTAS tracked the movement to a new location and when the TOC was back in place provided targeting information which resulted in another successful strike by Blue (figure 7).

• **SOTAS Locates CP Controlling Major Night Counterattack.** The Orange Forces after-action report for the night of 23 September 1980 credits SOTAS for locating the Blue Forces command post (CP) at the time it was controlling a major night counterattack. The CP was targeted immediately "... resulting in the apparent disruption of command and control and failure of the counterattack. The counterattack force was also discovered by SOTAS, immediately taken under fire and put out of action."

As can be readily seen by the examples highlighted above, I² SOTAS provided the division commander a system critically needed to fill out his arsenal of weapons. Evidence that SOTAS enables the commander to maximize use of firepower at his disposal can be seen in comments by the intelligence and operations offices of both divisions at the conclusion of Exercise Certain Rampart.

✔ *SOTAS is the best and usually the only station for targeting enemy (Reserve) forces.*

✔ *SOTAS is the best system for real time targeting . . . provides most timely information.*

✔ *SOTAS is a unique division asset capable of detecting and tracking enemy forces moving under conditions of radio silence.*

Both divisions clearly identified the link to maneuver brigades as a must, especially if they are to take full

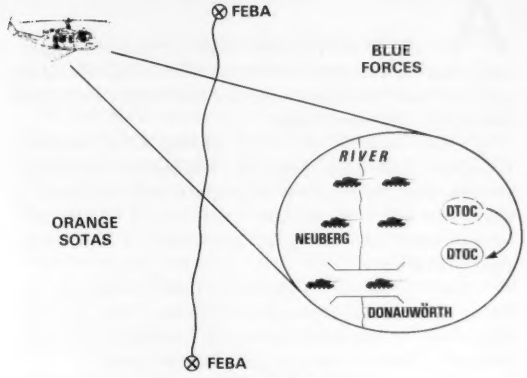


FIGURE 6

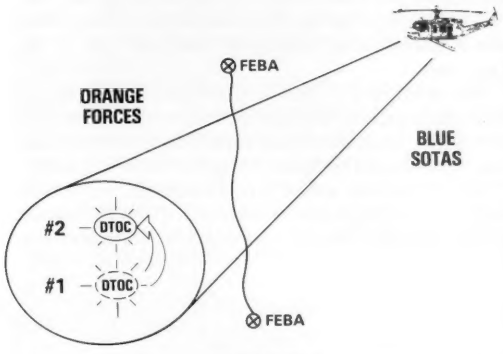


FIGURE 7

advantage of SOTAS capability.

After reading this article it is hoped that you have obtained a better understanding of what SOTAS is and how it is being employed. As the full understanding of SOTAS capabilities is obtained, only the imagination of the user limits employment of this combat intelligence source. It is a far-reaching intelligence gathering vehicle that will be used and—combined with other intelligence sources—provides the ground commander with the most accurate and timely intelligence flow ever displayed on the battlefield.

It provides the Army with a target acquisition capability that can be used to test and refine the operational and organizational concepts needed to better fulfill the tactical requirement.

This briefly describes the I^2 SOTAS. The research and development program scheduled to replace the I^2 SOTAS is currently in full-scale engineering development and will be going into production in the mid-1980s. Some of the improved features (figure 8) include:

- Advanced radar capable of operating in the electronic countermeasure threat environment of the mid-1980s and beyond.
- A significant increase in the range and accuracy of the radar.
- Improved performance of airborne platforms by using the modified Black Hawk EH-60 (for each per division system).
- Antijam data link transmitting simultaneously to many ground stations.

Editor's note: The SOTAS program is supported in Europe by a field office established by the SOTAS Project Manager. It is manned by LTC Chiota. If additional information is desired on I^2 SOTAS or the followon replacement program, please contact LTC Chiota at the European Field Office, APO New York 09403. Also, the ***Aviation Digest*** has published articles on SOTAS in the May and October 1980 issues. Copies of these articles may be obtained by writing: Editor, ***U.S. Army Aviation Digest,*** P.O. Drawer P, Ft. Rucker, AL 36362; or calling AUTOVON 558-6680, commercial 205-255-6680.

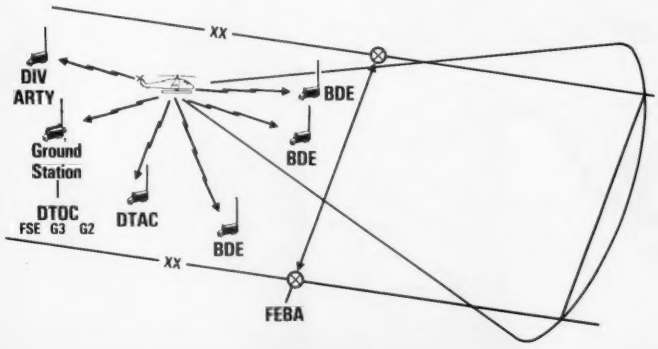
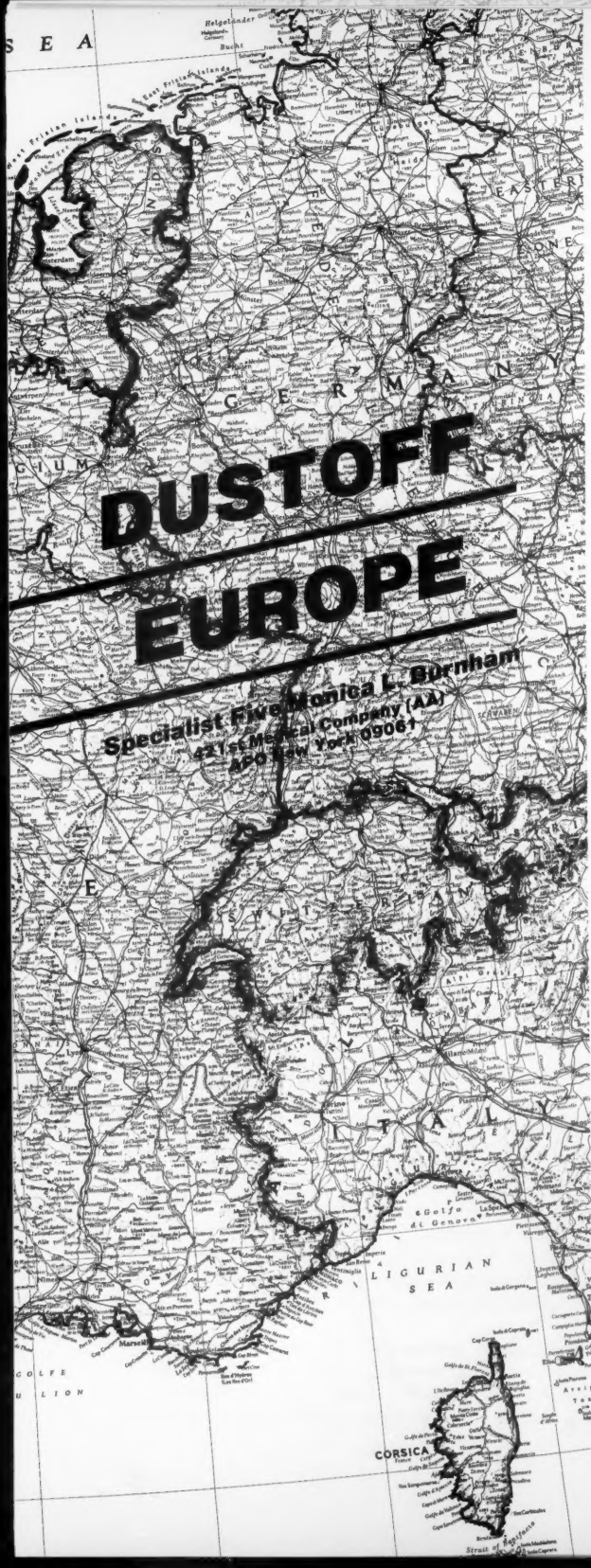


FIGURE 8



AN ARMY AVIATION medevac (medical evacuation) unit is a strange bird! It is both a medical and an aviation unit, bringing together two highly technical but vastly different fields.

A close look at the work of the 421st Medical Company (Air Ambulance), Nellingen, Germany, reveals that the mixture of aviation and medicine is beneficial because efficient, professional health care is combined with the speed and safety of helicopter transportation.

"Dustoff Europe" is the name used to identify the 421st, a battalion-equivalent aviation headquarters under the 7th Medical Command. Lieutenant Colonel Walter L. Berry Jr. is company commander.

In fiscal year 1980, there were 3,335 hours flown on 1,609 missions. The caliber of duty performance is offered by two Dustoff Europe units having won the 1980 U.S. Army, Europe Regional AAAA (Army Aviation Association of America) Aviation Unit of the Year award.

The company's job is providing aeromedical evacuation and the emergency movement of medical personnel, equipment and supplies to meet critical requirements and includes the support of field training.

Major training areas, like Hohenfels, are given medevac coverage; and many types of exercises, such as REFORGER (Return of Forces to Germany), are

CPT Scott Wells navigates during a mission

supported by the Dustoff units. This experience provides 421st personnel with valuable opportunities to perform their wartime mission in an actual tactical situation.

Not all medevac requests are for American military units and their people, however. Some of the missions flown are in support of the local German community. The Germans have a truly excellent air rescue system throughout the Federal Republic. But when a situation evolves that they cannot respond to because of poor weather conditions or lack of assets readily available, the German Rescue Center of Goch contacts the Joint Rescue Coordination Center (JRCC) at Ramstein Air Base which notifies the Dustoff unit closest to the emergency. Many of these missions are from rural areas without a hospital. Schweinfurt, the home of the 2/421st Medical Company (AA), is such an area. Recently, that unit was presented an award by the mayor of Hassfurt in appreciation and recognition of the numerous medevac's flown in support of that community.

Anytime a medevac is requested, the expertise of both medical and aviation professionals is put to use. The physician determines the status of the patient and requests the mission to be classified as routine, priority or urgent. The pilot checks the weather and decides whether the flight is a go/no-go. Although all Dustoff pilots are trained for night as well as IFR (instrument flight rules) flight, they can be limited by factors such as icing and turbulence.

Safety is a major concern of everyone in Dustoff Europe. Chief Warrant Officer, CW2, Joseph Hoy, Dustoff Europe aviation safety officer, remarked, "I think the people in the 421st are some of the most safety conscious people I've ever worked with." This is evident in the fact that Dustoff has flown accident free since March 1975.

But accident-free flying takes more than safety conscious individuals. Behind every successful medevac unit is a highly skilled, dedicated and efficient aircraft maintenance section. The aircraft maintenance people are always there — fixing, checking, repairing, replacing, cleaning and double-checking every part of every one of the 49 UH-1 Huey helicopters in Dustoff Europe.

How do the Soldiers feel about being part of Dustoff?

"It is the most rewarding job in Europe," crewchief Sergeant Glenn Whitt said. Sergeant Joseph Fifer, a fellow crewchief, added, "It is rewarding because what we do is closer to our actual combat mission than any other training method."

On the medical side, Specialist Five Jeffrey Saffold explained, "When I first got to Germany, I chose to be stationed at 97th General in Frankfurt. I had just come from a hospital in the United States and wanted to continue hospital duty. When I got here and found out what the job consisted of, I was thrilled. The responsibility involved with this job is a challenge. I

Dustoff units spend considerable time in the field

Behind every successful medevac is a highly skilled, dedicated and efficient aircraft maintenance section

want to meet that challenge and exceed if possible. I love people and dealing with people, which fits right in with my job of caring for them. I love it so much that, hopefully, my upcoming PCS [permanent change of station] to Ft. Carson will place me in a similar job as an air ambulance aidman."

Dustoff aviators use adjectives like satisfying and challenging to describe their work.

Chief Warrant Officer, CW2, Jeffrey Crisp, 4/421st Medical Company located at Darmstadt, said that flying medevac's is very rewarding. "I know I'm helping someone who needs my help, and I enjoy doing that."

Chief Warrant Officer, CW3, Robert Scott, who recently came to Dustoff Europe, compares his job with flying MAST (Military Assistance to Safety and Traffic) in the States: "Medevac flying in Europe is more dedicated to strictly military missions because the Germans already have an excellent ambulance service, both air and ground." He believes the duty is demanding. He said, "This work is much more challenging than some other assignments due to the real need to fly in all types of weather. This results in the pilots and crews of medevac aircraft being more proficient in all aspects of flying."

Upon termination of each mission, an after-action report is completed. All pertinent information and any significant remarks are entered by the pilot. These remarks, possibly more than any other source, illustrate what a medevac unit is. Sometimes it's comical: "The operations officer owes us for the dinner we missed tonight!" or "No problems en route. We need sleep. God save the Queen." Sometimes it is just a job: "Good flight," "easy mission." Sometimes it's concern: "Inadvertent IMC (instrument meteorological conditions) three times. Could not make pickup."

But mostly a medevac unit is people working together in mutual respect to help others: "Patient badly injured in one car accident — critical condition. Medic and crewchief worked well together." "SGT Welch deserves commendation for his handling of the situation and his performance as an NCO and as a crewchief." It is this spirit that keeps Dustoff, strange bird that it is, flying.

Dustoff commander LTC Walter L. Berry Jr., and crew prepare to depart from home station, Nellingen, Germany

PEARL'S

Personal Equipment And Rescue/survival Lowdown

Pam McLemore photograph by Tom Greene

Aviation Life Support Equipment (ALSE) Activities

The U.S. Army, Europe (USAREUR) Aviation Safety and Standardization Board (UASSB) will conduct the USAREUR ALSE Maintenance Technician Course from 26 January through 10 April 1981 at Dolan Barracks, Schwaebisch Hall. This course is designed to provide USAREUR unit commanders with school trained ALSE personnel. Some of the subjects to be covered include: Army regulations and training circulars; technical manuals and technical orders; forms and records; Nomex clothing; SPH-4 flight helmet; SRU-21/P survival vest; survival radios; test equipment; cold climate, hot climate, and overwater survival kits; life preservers; oxygen systems; multiplace rafts; antiexposure suits; and the ALSE training program.

ALSE School Update

The U.S. Army Transportation School (USATSCH) has been tasked with the responsibility of developing a course of instruction for aviation life support equipment.

The Transportation School's initial thrust is under way to establish a resident course for which graduates would be awarded an additional skill identifier (ASI Q2). Military Personnel Center (MILPERCEN) has already approved such an ASI, effective with a change to AR 611-201 to be published in March 1981. The kinds of ALSE to be addressed are: ejection seat (Mohawk), flight gear, survival vests and kits, flight helmets, life rafts, survival radios, oxygen masks and protective armor.

The initial thrust follows the Instructional Systems Development (ISD) model. This involves a Phase I operation or analysis of jobs and tasks, as well as comparable courses being presented in other services. The Air Force (Chanute AFB, IL) and Navy (Lakehurst, NJ) are being queried about their ALSE courses. Should the analysis indicate that the Transportation School could provide a cost effective and training effective resident course, an approximate time for conducting the first class would be in early 1982. Point of contact (POC) for further information is SFC Gary Parsons, USATSCH, AUTOVON 927-3494.

Survival Kit Mirror

A recent quality deficiency report indicated that during the course of routine 120-day inspections of hot climate, cold climate and overwater survival kits, several of the component signal mirrors (national stock number (NSN) 6350-00-261-9772) were found to be broken. Damage apparently occurred during normal handling of the kits due primarily to the positioning of the mirrors in close proximity to metal water cans and/or food packets. It is recommended that the signal mirrors be wrapped in protective packing (NSN 8135-00-142-9016) and then put in a 6 by 6 inch plastic Ziplock bag (NSN 8105-00-837-7754) prior to positioning them in survival kits. (Thanks to CW3 Harold Hintze, 3d Armored Cavalry Regiment, Ft. Bliss, TX, for this info.)

Editor's Note: It also may be advisable to consider similar protective measures for the small signal mirror, NSN 6350-00-105-1252, which is a component of the SRU-21/P survival vest.

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120 or call AUTOVON 693-3307 or Commercial 314-263-3307

PEARL'S

SPH-4 Flight Helmet

Questions have arisen from the field regarding the proper method for removing old epoxy from the inside of the helmet shell when installing a new liner. Some personnel have been hesitant (and rightly so) to use certain solvents on the SPH-4 and, consequently, have met with a great deal of frustration when attempting to remove that epoxy residue. TM 10-8415-206-13— the "Operator, Organizational and Direct Support Maintenance" manual for the helmet, flying, protective, model SPH-4—gives you very little assistance in alleviating that frustration; however, U.S. Air Force Technical Order (TO) 14P3-4-121 for the Helmet, Flyer's, HGU-39/P (the equivalent of our SPH-4) is somewhat more explicit. On page 5-3, paragraph 5-11 of this contractor prepared manual you will find instructions on the use of the methyl ethyl ketone (MEK) for the removal of epoxy residue from the helmet shell. Succinctly put, the TO recommends using a cloth very lightly dampened with MEK to remove all traces of residual epoxy, then allowing the shell to dry thoroughly—at least 2 to 3 hours—prior to installing a replacement liner.

If you are reluctant to use or are experiencing some difficulty in using MEK, you may try using toulene (NSN 6810-00-579-8430) or denatured alcohol (NSN 6810-00-782-2686). Although these will remove epoxy, they are not as effective as MEK. (Thanks to Marie Kilz, Directorate for Maintenance, TSARCOM, for this info.)

Worth Reading

The following piece is reprinted from the September 1979 ***Aviation Digest***. We have had a good response from this and thought we would share it with you again. It is entitled simply "The Enemy."

I am more powerful than the combined armies of the world. I have destroyed more men than all the wars of all nations. I massacre thousands of people every year. I am more deadly than bullets, and I have wrecked more homes than the mightiest guns.

In the United States alone, I steal over 500 million dollars each year. I spare no one, and I find my victims among the rich and poor alike, the young and the old, the strong and weak. Widows know me to their everlasting sorrow. I loom up in such proportions that I cast my shadow over every field of labor.

I lurk in unseen places and do most of my work silently. You are warned against me, yet, you heed me not. I am relentless, merciless, and cruel. I am everywhere—in the home, on the streets, in the factory, at railroad crossings, on land, in the air, and on the sea.

I bring sickness, degradation, and death, yet few seek me out to destroy me. I crush, I maim, I will give you nothing and rob you of all you have.

I am your worst enemy—I am CARELESSNESS.

Author unknown

Questions and Answers

Our supply section has been trying to order the larger AN/PRC-90 radio pocket to replace the one currently on the SRU-21/P survival vest, but, inasmuch as the pocket is not listed in the Army Master Data File, some difficulty has been encountered obtaining it. We feel that the new pocket is necessary for the vest in order to eliminate the problem of damaging the AN/PRC-90 radio, particularly the antenna. Could you please provide us with all the information needed to successfully order this pocket? (WO1 Charles McKain, HHC 3d Brigade, Ft. Campbell, KY)

You are absolutely correct concerning the necessity of this pocket on the SRU-21/P survival vest. The original vest pocket was designed with the AN/URC-10A and/or RT-10 radio in mind, and was not designed to accommodate the AN/PRC-90 with its folding antenna; consequently, a lot of damage to the PRC-90 and its antenna has resulted. Although there can be a lot of work involved when changing the vest pocket, there is also a substantial saving in wear and tear on the PRC-90, which, as we all know, is in very short supply, and also a saving on the equally scarce antenna. The AN/PRC-90 pocket can be ordered "off-line" from S9T under NSN 8415-00-442-3616 at a cost of $2.63 each. If you need a reference, you can quote U.S. Air Force Technical Order 1451-3-51 (Base Assembly, Use and Maintenance of Survival Kits) which also gives you instructions for removal of the existing pocket and installation of the new one.

Could you please provide us with the correct NSN for the 2-inch Velcro fasteners used for mounting the night vision goggles on the SPH-4 flight helmet? (CW2 Mike Sparks, A Co, 25th Avn Bn, Schofield Barracks, HI)

The stock number you are looking for is 5325-00-567-0258. The correct nomenclature is fastener, hook and loop, and it is available precut for installation on the SPH-4 from B16 at a cost of $.84 each. In addition, the following NSNs are furnished for the remaining items used in mounting the night vision goggles on the helmet.

Strap Assy Avionics, 5855-00-125-0762, B16, $3.59 each

Vee Strap Assy, 5855-00-125-0770, B16, $1.35 each

Sheet, Technical, 7610-00-137-9197, B16, $.19 each
Stud, Snap Fastener, 5325-00-285-6295, S91, $.11 each

Incidentally, all of these can be found in TM 11-5855-238-10 (Operator's Manual: Night Vision Goggles AN/PVS-5 and AN/PVS-5A). (Thanks to Marie Kilz, Directorate for Maintenance, TSARCOM, for this info.)

We have our AN/PRC-90 survival radios installed in the seat survival kits of our OV-1 aircraft. Our problem is with regard to the inspection interval for the PRC-90. We realize that the radios are supposed to be inspected monthly in accordance with TM 11-5820-800-12, but we have been inspecting them along with the seat kits as directed by our commander. This was fine while the inspection interval on the seat kits was only 90 days; now, however, the interval has been changed to 180 days. In our opinion, continuing to inspect the PRC-90 with the kit would result in an excessive time between radio checks, but we really don't want to remove the radio from the kit, either. What is your opinion and what do you recommend? (Carey Smith, AASF #1, GAARNG, Winder, GA)

As you stated, TM 11-5820-800-12, "Operator's and Organizational Maintenance Manual, Radio Set AN/PRC-90," specifies the monthly inspection interval for the PRC-90. The reason for such a short interval between preventative maintenance checks is that the radio has a rather high failure rate, due in large part to the fact that the BA-1568/U battery is subject to instantaneous failure. Consequently, it is advisable to inspect the PRC-90 with as great a frequency as practicable. We realize that a commander can legitimately direct that the inspection interval be changed to other than monthly (as per para 4-9, TM 11-5820-800-12); however, we feel that 180 days between inspections is quite excessive. If you feel that the 90-day interval you used before is acceptable, then you might consider continuing to inspect your seat kits with radio at that interval rather than going to 180 days. Another alternative would, of course, be to remove the radios from the seat kits and put them back in the individual aviator's survival vests where they would be more accessible for inspection purposes. Whatever you decide, we recommend you inspect your AN/PRC-90 survival radios as often as you can.

Is there a ski mask available in the supply system that we can order for our crewchiefs to wear during the winter? We understand that the Infantry has one and we would like to be able to get this item also. (John Skinnell, NJARNG ASF, Mercer County Airport, West Trenton, NJ)

We were not aware of any such ski mask, but, to be sure, we contacted the Clothing Branch at Natick Laboratories (NLABS). Personnel there confirmed that no such item would be found anywhere in the Army supply system. They did state, however, that units in Alaska have been authorized to locally procure ski masks for their personnel, but these masks are synthetic and not fire retardant. NLABS personnel also informed us of the development of a balaclava (similar to a ski mask) for combat vehicle crewmembers. This item is made of Nomex and will be available through the Army supply system within 1 year to 18 months.

Our medical support personnel say that two items in the tropical first aid kit contained in the SRU-21/P survival vest are controlled substances. These items are the chloroquine and primaquine phosphate tablets (NSN 6505-00-913-7905) and the dephenoxylate hydrochloride and atropine sulfate tablets (NSN 6505-00-118-1914). We were always under the impression that there was only one controlled substance in this first aid kit. Could you please clarify this matter for us? (CW3 Jim White, HQ Co., U.S. Army Garrison, Ft. Carson, CO)

To get the answer to your question, we contacted the item manager of the kit, tropical, personnel aid, tactical aircrew (NSN 6454-00-782-6412) at the Directorate for Medical Materiel, Defense Personnel Support Center (DPSC), in Philadelphia. We were informed that the latter item you mentioned—the dephenoxylate hydrochloride and atropine sulfate tablets—was the only controlled substance contained in this kit.

We are having problems ordering replacement food packets (NSN 8970-00-082-5665) for our survival kits. According to Supply Catalog C8900-SL, these items are coded "C" and thus controlled, requiring the approval of higher authority to obtain them. Can this be true? If so, is there some other reference we could use or any other way at all we could order these packets with less difficulty? (Don Marshal, HQ First U.S. Army, Ft. Meade, MD)

According to the supply catalog you referenced, not to mention the Army Master Data File, the food packet is indeed a controlled item. Since this seemed as incredulous to us as it obviously did to you, we decided to contact the item manager in the Directorate for Subsistence at DPSC. He indicated to us that the food packet should *not* be coded "C" and that there was no restriction on the item and that it could be ordered through regular supply channels. He also indicated that he would take appropriate measures to have the "C" coding removed from the item. By the way, other references to use when ordering the food packet are the supply catalogs for the survival kits—SC 1680-99-CL-A02, -A03, -A04, -A08, -A09 and -A10.

Fatigue in aviation operations

Captain Michael R. McCoy

U.S. ARMY SAFETY CENTER

MY FRIEND ERIC had always been a quiet, easy-going, friendly type and was a heck of a good pilot. But lately he'd changed. He had started having trouble concentrating and controlling his temper. He became tense and continually blamed others for his faults. His wife had become overwhelmingly concerned about his moodiness, his insomnia, and his eternal excuse of being tired. She couldn't understand what had come over him.

The crux of the matter was that Eric had become a victim of chronic fatigue due to a lack of crew rest. In a 3-week period, he had flown 50 hours in some of the worst weather possible—temperatures in the -20s with the winds up to 50 knots,

low ceilings, and snow. To further complicate his situation, he'd been working 14 or more hours a day for 24 days. During this time he had only one day off. Realizing his serious condition, both physically and psychologically, Eric had himself grounded until he could recover.

In recent years, crew rest has become a familiar term. And it stands to reason when we consider that 8 percent of all Army aircraft mishaps during an 8-year period were attributed to crewmember fatigue. Paragraph 5-9, "Crew Rest Scheduling Guide," and Table 5-1, "Scheduling Standards," of AR 95-1 provide a guide to the commander for recommended flight hours and length of duty period. Paragraph 5-9 also contains recommended crew rest periods under various duty conditions.

The commander is encouraged to develop his own crew rest policy, using AR 95-1 as his guide. The advice of the flight surgeon, the aviation safety officer and other staff members should be considered in determining criteria for his crew rest policy.

Now, let's say your unit commander has established a crew rest SOP which specifies an 8- or 12-hour rest period between duty periods. And let's say your duty day ended at 1700, but you end up in a poker game until 0200 and then stagger to the flight line at 0600 feeling exhausted. Would you be violating the unit SOP? It would take a wild stretch of imagination to justify such action. After all, it's your moral and military responsibility to get sufficient sleep and proper nourishment and avoid off-duty activities which would prevent you from reporting to duty physically sound and mentally alert. Ignoring this responsibility could result in your being the next fatigue statistic.

Types of fatigue

Fatigue is a self-recognized state. It is not the amount of work performed but rather how the individual feels. There are two types of fatigue—acute and chronic.

Acute fatigue is the more common. It is caused by excessive mental and/or physical activity and is a temporary condition caused by short-term stress. Its effects can be serious, but recovery usually requires only a good night's sleep.

Chronic fatigue is caused by a prolonged exposure to stress. This period could be a matter of days but normally is the result of weeks or months of exposure. Although the stress may not be as intense as that which would cause acute fatigue, it is a stress which will not go away. As a result, the body continually performs mental and physical tasks without the proper rest, nutrition, or recreation. The process is so gradual that a person may be unaware that it is happening. Some stresses which lead to chronic fatigue include family problems, career insecurity, and physical illness. The cure of chronic fatigue can be complex and usually requires an extended period of recuperation.

Symptoms of fatigue

The effects of fatigue are a point of contention with many people. Fatigue affects everyone differently, but often these effects are not noticed by the individual. It is even more difficult for someone else to determine if another person is suffering from fatigue.

Table 1 gives some of the symptoms a person with acute fatigue may feel and the corresponding signs other people may be able to see. In chronic

TABLE 1.—Acute Fatigue

Symptoms	Signs
Sleepiness	Tired, bored, slow, frequent yawning or sighing
Lowered standards	Increased rates of errors, sloppy, careless
Increased reaction time	Slow to respond, missing radio calls, rough on the controls
Physical exhaustion	Slow movement, increased effort to carry out work, complaints of cramps or stiff muscles
Irritability	Fault-finding, impatience, temper flareups, grouchy
Unable to concentrate	Instrument scan breaking down, indecisive, slow in solving simple problems

TABLE 2.—Chronic Fatigue

Symptoms	Signs
Forgetfulness	Forgetfulness, unusual preoccupation
Increased reliance on caffeine, alcohol, nicotine	Chain smoking, hangovers, coffee addict
Insomnia	Change of sleep habits, nightmares
Loss of appetite	Not eating well, loss of weight
Depression	Withdrawal, anxiety, fearfulness, confusion, sense of failure
Tenseness	Unable to relax, restless
Psychosomatic illnesses	Headaches, heartburn, constipation, diarrhea, vague chest pains, shortness of breath

fatigue, any or all of the signs and symptoms of acute fatigue may be present, plus some more serious ones as shown in table 2.

Fatigue cures

Once fatigue is encountered, its cure can range from simple to complex.

Acute fatigue can be relieved by rest and conditioning. It can be as simple as a good night's sleep. Good nutrition and physical conditioning will also help the body recover faster. Recovery time is usually a matter of hours.

Chronic fatigue is more difficult to overcome. It is as much a psychological as a physical condition. In some cases, professional help from a flight surgeon or psychiatrist may be necessary. Once a person has chronic fatigue, a vicious circle begins. The symptoms in many cases will promote the condition. Sleep is a basic human need, but a person with chronic fatigue may have insomnia. Good nutrition is essential, but he may have lost his appetite. One needs to be rational, patient, and calm yet may be irritable, anxious, and irrational. To recover, this cycle must be broken, but it often takes weeks or even months.

A change in environment such as a job change or a restful leave also helps. The problem or stress which led to the chronic condition must be solved, removed, or adapted to. Learning to leave your problems behind or learning to cope with them is essential to recovery.

Preventing fatigue

There are several simple management practices which can prevent fatigue in aviation units.

"Taking care of the troops" may be an old cliche, but it is one of the most important functions of supervisors. Supervisors should insure that all crewmembers are physically and mentally prepared for duty. Physical fitness, good nutrition, and high morale can all contribute to the battle against fatigue. PT is a sore point with many people but a body in good condition can better cope with stress. Insuring that adequate food and quarters are available will directly reduce fatigue and indirectly raise morale. Poor nutrition from missed meals or cold food and exposure from inadequate field equipment or training can quickly take its toll in the field environment.

Establishing and monitoring crew rest is usually the responsibility of safety officers, flight surgeons, and commanders. However, monitoring duty and flight hours for each person is usually coordinated by the platoon leader with the operations officer. These two people are the ones who make the system work.

All supervisors should lead by example. Discouraging late night parties and card games during the week or while in the field may be unpopular, but participation and encouragement at more appropriate times will more than make up for it.

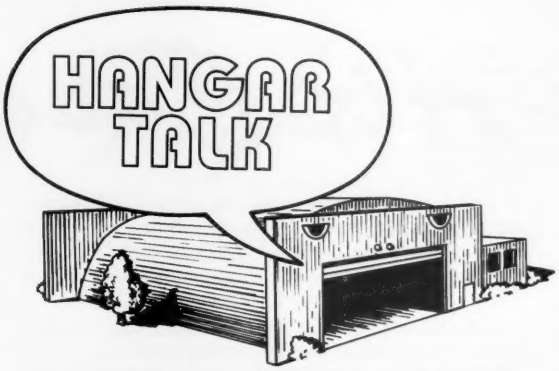
All subordinates should be taught how to prevent, identify, and cure fatigue.

All supervisors should have an intimate knowledge of their crewmembers. Through frequent participation in their missions and duties and close surveillance of their response to stress, the supervisor will be able to identify crewmember fatigue.

A crewmember showing signs of fatigue should be assigned shorter duty hours and less stressful missions. Under any condition, scheduling the same pilots to all the stressful missions should be avoided. Tough missions are often piled one after the other on the same crew. They may be the best crew available for the first or second mission, but eventually their skill will be reduced by fatigue.

Crew rest regulations and SOPs can only supply the opportunity for rest. While supervisors must do their part in preventing fatigue, it's up to crewmembers to maintain a mission-ready nonfatigue state.

This article was written from a lesson plan prepared by the author while he was attending the Aviation Safety Officer Course. The views expressed in this article are those of the author and not necessarily those of the Department of the Army or the Army Safety Center.



"Hangar Talk" is a quiz containing questions based on publications applicable to Army Aviation. The answers are at the bottom of the page. If you did not do well, perhaps you should get out the publication and look it over.

METEOROLOGY
FM 1-30

CW2 Gary R. Weiland
Directorate of Training Developments
U. S. Army Aviation Center
Fort Rucker, AL

1. Which example best illustrates the composition of the earth's atmosphere?
   A. 78% oxygen, 21% hydrogen, 1% other gases
   B. 78% nitrogen, 21% oxygen, 1% other gases
   C. 78% hydrogen, 21% oxygen, 1% other gases

2. A barometer reading of 30.2 inches of mercury indicates:
   A. High pressure
   B. Low pressure

3. A change in atmospheric pressure of 10 millibars (about 1/3-inch mercury) below 10,000 feet altitude can result in an altimeter error of how many feet?
   A. 100
   B. 300
   C. 500

4. What type of front is depicted by this symbol on a weather map?
   A. Warm
   B. Cold
   C. Stationary
   D. Occluded

5. When saturated air flows over a stationary object, ice may form on the object when the free air temperature is how high?
   A. +2°C
   B. +4°C
   C. +6°C

6. In what temperature range does the most severe icing occur?
   A. 0°C through -10°C
   B. -10°C through -20°C
   C. -15°C through -25°C

7. What is the most serious form of structural ice?
   A. Frost
   B. Clear ice (glaze)
   C. Rime

8. Conditionally unstable air with relatively high moisture content and some type of lifting action are ingredients for which type of weather phenomenon?
   A. Thunderstorm
   B. Hurricane
   C. Fog

9. Which condition is most likely to cause fog to form?

Wind	Temperature—Dewpoint Spread
A. Calm	2°C to 4°C
B. Light	4°F to 6°F
C. Light	less than 2°F

10. What do meteorologists determine by using pilot balloon (PIBAL), radiosonde balloon (RABAL), radiosonde observations (RAWIN)?
    A. Humidity
    B. Icing level
    C. Winds aloft

ANSWERS (FM 1-30)

1. B. Para 2-2a
2. A Para 2-19d
3. B. Para 2-22b (4)
4. D. Para 7-1b (4)
5. B. Para 9-2a
6. A. Para 9-2a
7. B. Para 9-3a
8. A. Para 10-2
9. C. Para 8-2
10. C. Para 13-3

Dragoon Air Cavalr

WHEN YOU ARE located close to the "real thing," a surprise penetration by threat ground forces causes the adrenaline to flow faster! We in the Dragoon Air Cavalry were fully aware those were friendly forces, but we were also cognizant of the threat being very real. That is why the exercise, Dragoon Air Cav Fight, was so important to us.

First, let me introduce you to our squadron.

Dragoon air assets are organized into two aviation troops: Cobra Troop compares to a standard attack helicopter company with 21 Cobra TOWs, 13 OH-58 Kiowas and three UH-1 Hueys. Combat Aviation Troop has 13 UH-1s, 8 of which are equipped with M-56 mine systems to form a mine-laying platoon, and 16 OH-58s. Ten of those belong to the scout platoon while the remainder of them and the UH-1s form the command and control platoon.

In the 2d Cavalry we developed a technique for cross-attaching the aviation assets between the two aviation troops to fit the tactical situation. We call this technique "air scramble" and the result is that each aviation troop commander is given a mix of scouts, and M-56 mine birds and Cobras. The technique is similar to the way tanks and infantry are task organized to fight the ground battle. This gives the commander flexibility to fight a short duration battle independently should that be required. It also provides the aviation troop commander with a wide range of options in supporting a ground squadron with its battle. This configuration allows the aviation troop commander to find the enemy, stop him with mines, and kill the enemy by hitting him in the flanks and rear with tube-launched, optically-tracked, wire-guided (TOW) missiles and rockets at the troop commander's place and time of choosing.

This technique was the basis for organizing aviation assets for the Dragoon Air Cavalry Fight. There are other concepts, unique to the 2d Cavalry, that were also tested during the exercise. A few that might have application throughout the aviation community will be discussed before describing the air cavalry fight.

• The first is a concept called "Foggy Strike," a term used in the regiment to define a system for getting aircraft to the battle through marginal weather when good shooting exists at the battle location. Weather history provided us with information that, during certain seasons of the year, marginal weather would exist between home base and the planned battle area while good shooting was, in fact, available at the battle area. To prepare for this, a system was developed that encompassed specific nap-of-the-earth routes over which crews rehearsed. These routes were to be flown slowly while passing through marginal weather. Terrain memorization was necessary to ensure this could be accomplished when the battle started. Additionally, crews were trained to move to battle locations using commercial and tactical beacons should the method of choice, visual nap-of-the-earth, not be possible. Foggy Strike, used during the deployment phase of Air Cav Fight, was very effective.

FIGURE 1: Air Cavalry Vee

FIGURE 2: THREAT forces' main avenues of approach

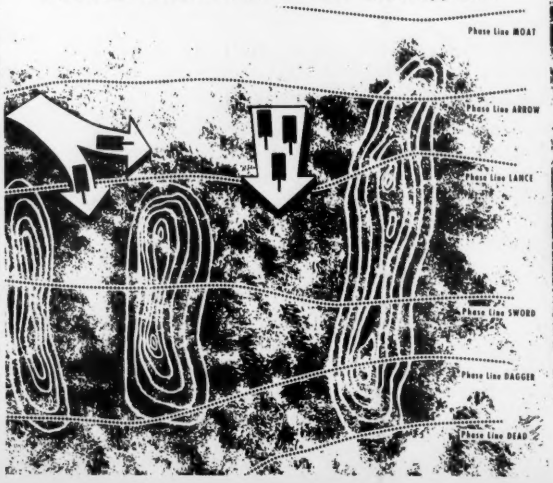


FIGURE 3: THRE

lry Fight

Lieutenant Colonel Jon C. Stillman

A training exercise which provides valuable lessons is well worth the money, time and effort invested in it. This article describes such an exercise which occurred in September 1979. The fact that its site was along the East German and Czechoslovakian border added realism to the 4 days of training for the 900-member Command and Control Squadron, 2d Armored Cavalry Regiment (2d Dragoons). The author was squadron commander at that time and is currently the training management officer for the Combined Arms Services Staff School at Ft. Leavenworth, KA.

• Another concept we exercised was the employment of the Vee Technique. The Air Cavalry Vee Technique is an incremental approach to bounding overwatch. It incorporates the characteristics of control, mutual support and the delivery of maximum firepower. Figure 1 illustrates the basic Air Cavalry Vee. The Cobras provide cover and overwatch to the advancing or withdrawing scouts or guns as the situation may dictate. The only radio calls made during employment of the technique are "move" when the scout or section initiates movement and "set" when the scout or section establishes and is ready to provide overwatch so that the next scout or section can move. The platoon commander positions himself where he can best control the maneuver. This is a basic technique that has an unlimited number of variations. Though simple in concept, it needs extensive training to work effectively.

• Finally, we tested the concept of using the air cavalry troops to give the regimental commander a responsive force to employ against a quick-breaking battle. While employing one troop in sector, depending on the situation, another will normally be held in reserve to guard against a quick-breaking threat attack, particularly along the flanks. During Air Cav Fight the scenario was tailored to test this concept and it was determined to be viable!

The exercise, which took place in a valley area simulating general defense plan (GDP) positions, began with an alert and deployment of the air cavalry troops in a screening role along the border. The first 2 days were fought by the Cobra Troop and the second 2 days by the Combat Aviation Troop. Each commander was given a threat situation depicting a rapidly developing enemy penetration along the regimental flank and was ordered to counter that threat. The size of his sector compared to that normally assigned a ground squadron; and each troop's mission was to move to contact, find, fix and destroy the enemy in sector. Then successive battle situations required the unit to screen, delay and defend in sector.

Airborne umpires were tasked to evaluate platoons, while others evaluated combat service support and reporting procedures. When aircraft came under fire, the enemy force would fire a colored star cluster. If an umpire assessed a "kill," the aircraft was ordered out of the area. Also, when an enemy vehicle was killed, it would release a colored smoke. Visual evidence of kills provided tremendous motivation to both forces.

The enemy force represented lead elements of a threat motor rifle division and was simulated by 20 M151 jeeps with different colored identifying flags to designate them as T-62 tanks, BMP personnel carriers, ZSU-23-4 air defense systems or as dead vehicles. This allowed aircrews to spot vehicles by type. Enemy movement was controlled by a squadron cell that also fed missions to the friendly forces. In some of this exercise, the enemy force was split, with 10 vehicles operating along each of two different avenues of approach.

THREAT forces overrun FARP

FIGURE 4: THREAT forces trapped and destroyed

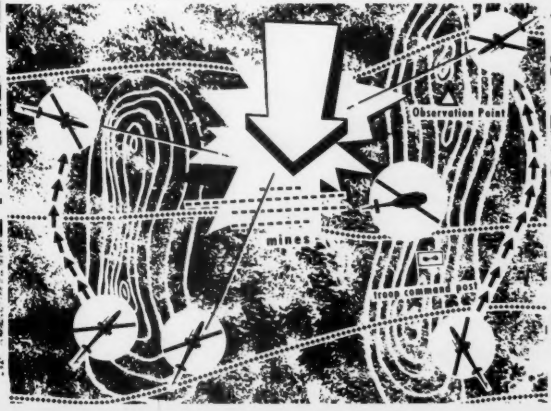


FIGURE 5: Rear attack of THREAT Aircraft

Weapons used included TOW, both direct and indirect 2.75 inch rockets, supporting artillery and, to a lesser degree, 7.62 mm minigun and 40 mm grenades. Barriers were established by the mine helicopters and by combat assault teams.

During the course of Air Cav Fight, four battle situations were presented to each of the troop commanders. I want to describe highlights of two of those, one a disaster and one a success. Figure 2 shows the threat situation.

First, the disaster (figure 3): The troop commander was given the mission to establish phase line Dagger, move to contact, find, fix and destroy the enemy in sector. The threat force was ordered to move along the main avenue of approach, and the timing should have allowed the battle to start south of phase line Lance. What happended instead is that the troop commander asked the regimental tactical operations center (TOC) if there were any friendlies forward of phase line Lance. The response was "no." This was interpreted by the commander to mean that friendlies were at phase line Lance, and he blitzed his scouting elements to that phase line without searching the area. This resulted in disaster. His troop TOC was bypassed, and his forward area refuel/rearm point was overrun before he realized where the enemy was. The end result in this situation would have been defeat of the air cavalry troop and a serious threat to the regimental flank.

In the successful battle sequence (figure 4), the commander identified the threat force moving south along the major avenue of approach and established a trap between phase line Sword and phase line Lance. This allowed him to structure the place of battle through the use of M-56 mines which were laid well before the threat forces reached the battle area. While a combination of stay-behind observers and aerial scouts maintained contact with the advancing force, the commander coiled his Cobras so they could move to predetermined firing positions that allowed flank and rear shots on the enemy. As the opposing forces entered the trap, the aviation commander hit them with artillery and indirect rocket fire and followed that with the flank and rear TOW shots from the Cobras. The enemy was destroyed in place.

It was an advantage to have the "disaster" develop along with the more successful endeavors because we learned what we were doing wrong as well as what we were doing right. Some of the major lessons drawn from the exercise were:

- Movement to contact must be deliberate, well coordinated and precise. Some of our initial moves were too hasty, resulting in the bypassing of enemy forces along major avenues of approach.
- Verbal orders must be brief, accurate, easy to interpret and precise. A terrain index system is a must to ensure ease of understanding and rapid response to verbal orders.
- Both the Cobra and Combat Aviation Troops used ground observation posts (OPs) effectively, and it was agreed they were essential to success in this type of battle. OPs were placed on key terrain features throughout the area and on a number of occasions were the first to report movement by the enemy. Aircraft could then be brought in to confirm the reports and conduct the battle. This technique needs to be developed fully to further enhance productive use of air assets in areas not easily covered by OPs.
- It was determined that the troop commander was in fact the battle captain in this situation and that he had greater success controlling events from his aircraft well forward than from his ground TOC. He could move to and assess each battle in order to more accurately establish priorities for his resources.
- Even though the Cobra TOW can outrange enemy tanks, frontal engagements are not desirable. The rolling artillery barrage technique used by the potential threat could have a disastrous effect on aircraft in its path. Also, the enemy force during Air Cav Fight picked up aircraft to its front relatively quickly. The air cavalry troop commanders learned to set up ambushes which allowed them to attack the enemy forces from the flanks and rear. The critical aspect here was not maximum effective range but rather maximum effective use of terrain.
- During Air Cav Fight, aircraft representing HIND-Ds were used in several battles. Both troops had an alert procedure that announced the first sighting of a HIND-D and which resulted in the enemy helicopter's position being tracked in every case once the alert was given. Angle of attack was found to be the most critical aspect of engaging the HIND-D with TOW. Tracking was not possible when the enemy aircraft was passing perpendicular to the path of the attacking aircraft but was relatively simple when the attack came from the rear (figure 5). It was the unanimous stand of our Cobra pilots that a 20 mm cannon would have been the ideal weapon in this situation.
- On some occasions it was deemed necessary to risk Cobra TOW helicopters in a semiscouting role so their optics could be used to identify the enemy at long range. Scouts need improved optics!

Air Cav Fight demonstrated that the air cavalry can be effective against a fast-breaking enemy attack. It further proved that air cavalry is an essential force as a part of the regimental battle group with its requirement to fight on a widely dispersed active defense battlefield.

Lessons learned from this exercise should prove valuable not only to the 2d Armored Cavalry Regiment but to the entire aviation community.

REPORTING FINAL

Late News From Army Aviation Activities

FROM TRADOC

THE AIR LAND BATTLE: A Message from the TRADOC Commander. Now that the integrated and extended battlefield concepts are being assimilated by the TRADOC community, a need exists to tie these concepts into one overarching descriptive term. Though the words "integrated" and "extended" convey concepts, they do not accurately describe the battlefield in its totality. They do, however, have utility when we talk academically or doctrinally about subsets of the battlefield. The term ***air land battle*** best describes and ties these two concepts, and all others, together. Henceforth, when we talk about the total battlefield the term ***air land battle*** will be used. Combat developers working on future systems also need a term to use as a conceptual basis for the development of requirements. That term will be ***air land battle of the 1990s.***

General Donn A. Starry

FROM FORT RUCKER

Graduation Speaker. Major General George W. Putnam Jr., commanding general, Army Physical Disability Agency, Walter Reed Army Medical Center, and director of the Army Council of Review Boards, Office of the Secretary of the Army, Washington, DC, was guest speaker for three graduating flight training classes.

He told the 85 graduates they will share in helping Army Aviation to realize its full potential as a combat arm in terms of its impact on the enemy and its support of United States ground forces.

"You will have help for that task," he said, "from all these beautiful machines, the organizations, the doctrine and the training."

General Putnam, who has been in the Army for 38 years, and an aviator since 1956, reminisced about the "vast forest of ignorance" he said he first encountered in relation to the proper use of Army Aviation.

"There was a lot of talk. . .about the cavalry, about arming helicopters. . .but there was no evidence ot it . . .," he said, speaking of the period (late 1950s and early 1960s) when Army Aviation's combat threat was limited to experiments with machineguns strapped to the skids of aircraft.

"I didn't know what I was getting into (when he joined the aviation team)," he said. "But you do. You have all these beautiful machines, the organizations, the doctrine and the training areas."

General Putnam told the graduates that during

ADVICE FROM A VETERAN. The Distinguished Graduates of the Warrant Officer, Officer and Europe/NATO Rotary Wing Aviator Classes that finished 9 months' training in December at Ft. Rucker, AL, talk with their guest speaker, Major General George W. Putnam Jr. who has been an Army aviator for 24 years. He has some good advice for, from left, Warrant Officer, WO1, Jakob (sic) Primgaard, Second Lieutenant David L. Patterson and German Air Force Staff Sergeant Ralf P. Hampel. (USAAVNC PAO Photo)

ALL ABOARD. Company B loads seven UH-1 Huey helicopters aboard a C-5 Galaxy cargo plane. The Company claims to have set a record for ANG units with this accomplishment. (Photo by MSG Frank Bryson)

his career in aviation he found a tremendous lack of knowledge about the role of aviation and warned them that they, too, would find "profound and disturbing" things about their new career field.

"What . . . you need to do now is to clear that away," said the guest speaker, referring to the lack of knowledge he recounted earlier.

(USAAVNC-PAO)

FROM DELAWARE

Record Claimed. Company B, 150th Aviation Battalion, Delaware Army National Guard, loaded seven UH-1 Huey helicopters aboard an Air Force C-5 Galaxy (see photo) as a mobilization readiness exercise at Dover Air Force Base. The operation took several hours to complete, and participants believe the coordination between the National Guard and Air Force personnel was as beneficial as the actual loading experience, since the various components would work together in a mobilization.

(101 PAD)

FROM ST. LOUIS

ALSE Pathfinders. Work done by the 2d Squadron, 10th Cavalry, 7th Infantry Division, Ft. Ord, CA, in the aviation life support equipment (ALSE) field has been proclaimed as a precedent for other Army units to follow.

It began in 1979 when LTC Tom Trombley, squadron commander, established an ALSE section in the unit and appointed Chief Warrant Officer, CW3, John Vasko to direct it.

Four enlisted Soldiers were assigned to the section and were trained as ALSE maintenance specialists. The NCOIC attended the Air Force ALSE Specialist School at Chanute Air Force Base, IL; and by October 1979 the squadron had a well-trained staff working in its ALSE shop.

An informal Division Life Support Council was established which meets quarterly or more often if needed to discuss current trends in ALSE and to assist member units in any problem areas. Too, liaison was established with three units outside the squadron to obtain assistance for the ALSE program: the 7th Medical Battalion Supply to procure and inspect medical items for the survival and first aid kits, the Directorate of Industrial Operations to inspect and repair the flotation equipment, and the Airfield and Facility Safety Section to advise on ALSE administrative matters.

Under the 2d Squadron's system, all ALSE is stored and maintained in the ALSE shop so it is readily available to shop personnel for preventative and scheduled maintenance. Before a flight, a crewmember will go to the shop and pick up the life support equipment. Any special ALSE that is needed for a flight also is issued at the shop.

Major repairs to SPH-4 helmets can be made on the spot, and the helmets can be refitted at any time by the ALSE maintenance specialist.

The 2/10th's ALSE mission is support and the password is good service. It all equals some of the best lifesaving insurance Army Aviation crewmembers can have.

JUST WHAT A WRITER NEEDS. Ronald R. Simmons accepts an engraved ballpoint pen from Fran Willison, manager of the Army Aviation Center Thrift Shop, Ft. Rucker, AL. This is part of the recognition he received as winner of the *Army Aviation Digest's* monthly writing award in October 1980 for his article, "The Real Thing." As a service to Army Aviation, the Thrift Shop provides a pen each month for the winning author who also receives a Certificate of Achievement from the Army Aviation Center's commanding general, Major General Carl H. McNair Jr. (Photo by SP4 Deb Ellis)

Assistance to establish a similar ALSE program is available for all Army units. Write DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120, or call AUTOVON 693-3307 or commercial 314-263-3307. CW3 Vasko also offers his help and has conducted some workshops on this subject. Contact him at Ft. Ord, AUTOVON 929-2006. **(DRCPO-ALSE)**

FROM FORT MONMOUTH

Academy Prep School Accepting Applications. The United States Military Academy Preparatory School (USMAPS) is accepting applications for the class of 1981-82 which begins in August. Application deadline is May.

USMAPS is an Army school that assists selected enlisted members to prepare and qualify academically, physically and militarily for admission to the U.S Military Academy, West Point, NY; and all USMAPS graduates automatically receive a nomination to that school.

The 10-month academic year at USMAPS emphasizes English and mathematics. Applicants are urged to apply early as admission is highly competitive. Last year, more than 1,200 regular Army Soldiers applied for the 170 vacancies available at USMAPS.

The basic eligibility requirements are simple. An applicant must be:

- A citizen of the U.S. or able to become a citizen prior to entering USMAPS.
- At least 17 and not 21 years of age on 1 July of the year he or she enters USMAPS.
- Unmarried and have no legal obligation to support a child or children.
- In good health, have no disqualifying physical defects and have vision correctable to 20/20.
- A high school graduate, or the equivalent, with a solid academic background. Ideally, applicants should have 4 years of English and 3 years of college preparatory methematics. An individual with obvious leadership potential but a weaker academic background should not be discouraged for applying since many factors are considered.

Applicants should be highly recommended by their commanders. A Commander's Counseling Guide is included as the Appendix to AR 351-12, dated 1 October 1980. All recommendations from the chain of command are closely reviewed in an effort to ascertain the applicant's maturity, motivation and desire.

Inclosures to the basic application are described in paragraph 9, AR 351-12. School transcripts and SAT/ACT test results may be forwarded separately; however, military personnel offices and commanders should ensure that the following items are included with the basic application:

- Medical forms (SF 88 and 93) not more than 1 year old.
- GT score.
- ETS date.
- MOS.
- Most recent BPFT/APFT results, less than 1 year old (baseline PT scores cannot be accepted).
- Current photograph.
- Commander's evaluation.
- Personal handwritten essay, subject: *Why I want to attend the Prep School and my goals in life.*

Further information may be obtained by calling the USMAPS Admissions Office at AUTOVON 992-1807 or commercial (201) 532-1807, or by writing to the Commandant, U.S. Military Academy Preparatory School, ATTN: MAPS-AD-A, Ft. Monmouth, NJ 07703.

FROM ARIZONA

More Launchers. Hughes Aircraft Company at Tucson has received a $2.2 million addition to its 1979 contract to build lightweight rocket launchers for U. S. Army helicopters. Before this latest order for 722, the Army Missile Command had contracted for 2,020 launchers which are used to fire the 2.75-inch rocket. Hughes is building a 7-tube version as well as the 19-tube model. The first of the aluminum launchers was delivered in July 1980. **(HUGHES ACFT CO)**

THE ANATOMY OF THE MIDAIR

AT ANY POINT in time, it is possible to scan the sky and not be able to spot an aircraft in flight. Even at crowded metropolitan airports one is seldom able to see more than a few airborne aircraft — one or two in various positions on or after takeoff, while one or two are on approach or landing. It is not uncommon while at an air training complex to look around and see only one or two aircraft going their separate ways. However, when one is exposed to the traffic pattern at a training base or the gaggle of aircraft at a field site during a field training exercise, it is not uncommon to see a host of aircraft concentrated in a relatively small area like sardines in a can. Heavy traffic or light traffic, control must be maintained. For this reason, control zones, approach/departure control, and tower/ground control as appropriate, have been established in all such areas. These are necessary to provide a safe flight environment and to bring about order out of what would otherwise be chaos.

Still, midair collisions do occur, and it is fair to ask the question "Why?" Futhermore, why do these catastrophic mishaps occur when the weather conditions can best described as "severe clear"?

An analysis of the following midair mishaps might be helpful in understanding the problem. They are not necessarily in chronological order.

1. A midair over Oregon resulted in two Army OV-1 Mohawks destroyed. Fortunately, the four crewmembers ejected safely from their disabled aircraft.

2. Two Army aircraft collided off the California coast, resulting in two aircraft destroyed and three fatalities. One crewmember escaped serious injury.

3. Two Army aircraft collided over a controlled field. As a result both aircraft were destroyed; fortunately, the six crewmembers sustained only minor injuries. The psychological impact of this traumatic experience has yet to be assessed.

4. A midair collision over an eastern resort area destroyed both civilian aircraft and claimed six lives. There were no survivors.

5. Then, there was the disastrous midair collision over San Diego involving a Boeing 727 and a Cessna 172. There were no survivors.

All of these midair collisions occurred in day VMC (visual meteorological conditions) with excellent visibility. By all reasonable standards, these mishaps should not have occurred. Why, then, did they?

The prevention of midair collisions is based on the "see and avoid" and "air traffic control" (ATC) concepts. Each has shortcomings that cannot be overcome, even though they are oftentimes simultaneously employed to compensate one another. See and avoid has the physiological deficiency of the human eye

and the structural deficiency of the aircraft. ATC is deficient because it does not and cannot control *all* air traffic within the parameters of altitude, direction and speed. The human eyes have their "blind spots" while ATC has its electronic "blind spots." There are, of course, ways of diminishing the effects of the blind spots, but they can never be totally corrected or eliminated. One can compensate for the eyes' blind spot by movement of the head or body and by maneuvering the aircraft, but parts of the sky will still remain unobserved. Remember that an aircraft on a collision course and airspeed with your own aircraft *does not move relative to you.* Thus, the most significant acquisition clue— movement— is not available. If an aircraft which you had previously sighted turns onto a collision course, it assumes a fixed position in your field of view and may seem to "disappear" until other clues—color, texture, lights, etc., make it visible again. A high rate of closure may, unfortunately, make this next sighting of academic interest only. However, you can reduce the possibility of this occurring by small and frequent changes of heading or attitude, i.e., maneuvering your aircraft to obtain relative motion of the conflicting aircraft. Electronic blind spots are more subtle, their causes more varied, and, therefore, more difficult to correct. They can be caused by terrain, weather and atmospheric conditions, mechanical and electronic breakdowns, and human factor anomalies to name a few. Such deficiencies are generally corrected by redundant systems and alternate methods of control, as in the case of the control tower operator who may use electronic controls, but can also employ visual controls. Or in the case of malfunction of the en route electronic control, it is possible to change over to en route control through other methods.

Good communications are vital to collision avoidance when the see and avoid and the air traffic control concepts are employed. Any breakdown in this medium will negate all the ATC efforts and in many cases will adversely affect the see and avoid concept.

This is especially true of Army Aviation operations outside of established control zones, which are dependent upon good communications (visual and radio), for mission accomplishment and safe operations. Collision avoidance is generally dependent on the see and avoid concept, tactical ATC, unit standing operating procedures and adherence to mission profiles—all tied together by the maintenance of good flight discipline.

In the five midair mishaps previously listed, cases #1 (the OV-1's over Oregon) and 2 (the Army aircraft off California)indicate that the pilots had been flying in position to *see* one another, yet were unable to *avoid* a collision. In case #1, after the assigned mission was completed, the two pilots decided to fly formation. If the pre-mission briefing included formation flight as a part of the mission, it proved inadequate to the demands of the situation. It appears that the two pilots merely improvised the formation scenario as they went along.

In case #2, after the assigned mission had been completed, the two crews, which had been in sight of one another, failed to communicate their intentions and ultimately ended up in the same airspace. The see and avoid concept was unable to overcome the inadequacies of mission profile and communications.

Case #3 (Army aircraft with six crewmembers) was unique in that the midair occurred at a controlled field with qualified tower personnel on duty; qualified instructor pilots and student observers onboard both aircraft; and established traffic patterns being used during excellent daytime weather conditions. See and avoid and ATC could not overcome the shortcomings of pattern deviations and communications.

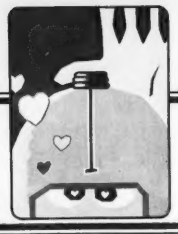
Case #4 (civilian aircraft over a resort area) is a typical midair collision where there is no control, no communication, and apparently two pilots so engrossed in their own little worlds that there was no attempt to see and avoid. The known results were inevitable.

Case #5 (the San Diego midair) on the other hand, is a classic example that nothing is foolproof. Radar for electronic observation and control and all communicative equipment was in good working order. The control zone was manned by experienced ATC personnel, while the aircrews of both aircraft were equally well qualified. As it happened, the ground controller saw a possible conflict of flightpaths, alerted the crew of the airliner, received an acknowledgment of the transmission and verification of visual sighting of the traffic. The radio transmissions were received and acknowledged loud and clear, but, unfortunately, not interpreted correctly. Shortly thereafter, there was nothing more for ATC to control; there were no survivors. The concepts of see and avoid and ATC, backed up by the best communication equipment and experienced personnel, failed to prevent the midair.

The examples of midair collisions cited and discussed do not cover every type and cause. The reader can, no doubt, cite other examples which properly analyzed would indicate possible remedial measures.

Still, from all of the foregoing discussion, a message appears to come through loud and clear. Aviators are the only ones who can fill the gaps in the collision avoidance mechanism. They must be totally familiar with the deficiencies of the human eye, the aircraft structure, radar and communication equipment. They must be aware of the need for complete pre-mission briefings, the need for understandable communications, and the safety problems that can develop when deviating from planned mission profiles. Recognizing this, the aviator—by applying good flight discipline, by exercising the proper degree of caution and by staying alert—can greatly enhance the collision avoidance mechanism.

VIEWS FROM READERS



Editor:

Any ex-airgunners among your readers are invited to write to me about their combat experiences, training and weaponry. I would welcome such reminiscences, as I am currently researching material for a book on the subject.

Sidney Allinson
24 Ravencliff Crescent
Scarborough, Ontario
Canada M1T 1R8

Editor:

Mr. Garrett's article, "Red Lights Can Mean Trouble," September 1980, presents some relevant data concerning detector spectral sensitivities. However, it fails to give adequate attention to the reason that red lighting is used (and has been since pre-World War II days) in the first place, i.e., that it provides better dark adaptation than any other color. Work by this laboratory has shown that under some realistic conditions, red lighting can provide up to 25 times greater sensitivity than, for example, the Air Force's blue-white lighting. Also, a recent study by the Tank-Automotive Research and Development Command in Warren, Michigan, showed that, under their conditions, nonsmoking subjects required an average of 50 percent more time to readapt after exposure to blue light than to red and smokers required an average of 70 percent longer to readapt after exposure to the blue light than to the red.

The main shortcoming of our present incandescent red lighting, as Mr. Garrett points out, is that it emits a large amount of infrared light to which night viewing devices are very sensitive. However, there are possibly other forms of red lighting which would not have this problem. Also, the statement that "to date, all attempts to dim, filter or uniformly distribute incandescent lighting for NVG compatibility have been unsuccessful," is in error. At Ft. Rucker, representatives from the Directorate of Combat Developments, Northrop, Inc., and the U.S. Army Aeromedical Research Laboratory succeeded in modifying the incandescent red lighting in a UH-1H aircraft to the point where it provided an excellent display through the NVGs and did not adversely affect their sensitivity to outside viewing.

Having considered these various arguments, the U.S. Army Lighting Advisory Committee has recently adopted the position, for its lighting retrofit program, that the lighting for naked eye operation should continue to be red while lighting of some other color may be installed for NVG operation.

COL Stanley C. Knapp
Commander
U.S. Army Aeromedical Research Laboratory
Ft. Rucker, AL

Editor:

As the author of "Altitude Planning—A Critical Edge" (October 1980 ***U.S. Army Aviation Digest***), I was disturbed by the statement that appeared at the beginning of the article:

"The author has predicated his article on the assumption that suitable charts will be available in sufficient quantities, that there will be adequate time for detailed evaluation of the terrain, and that the sections responsible for maintaining and placing the radio beacons will be able to keep up with the rapidly changing geographic movement of the battle area."

This disclaimer by the responsible DA authority implies that these conditions most likely will not exist, and thus the usefulness of tactical instrument flight (which likewise is based on the same assumptions) is limited at best.

On the other hand, the same DA authority stresses those very same assumptions and techniques in both training and annual standardization requirements. Tactical instrument planning, flight and approaches using those assumptions called into question by the disclaimer are required for annual instrument renewal; and the tasks calling for this type of planning are required for semiannual minimums.

It therefore appears that somewhere people are not communicating. Either the assumptions are valid (thus not requiring a disclaimer) and tactical flight is a necessary and viable technique; or the assumptions are normally invalid (requiring the disclaimer) and we are spending considerable time and money training for something we will never (seldom?) use.

CPT Frame J. Bowers III
U.S. Army Reserve
106 Fieldstone Dr.
Terrace Park, OH 45174

Editor:

Reference the maintenance/inspection platform illustrated on page 40 of the October 1980 issue of the ***U.S. Army Aviation Digest.*** It looks like SFC Simone has a real good idea there. My only suggestions are these: Apply nonskid (sandpaper) paint on the treads (if not already done); and affix a long streamer to one side of the platform so as to attract attention to the presence of the platform.

Even as a psychologist I can't begin to tell you what goes on in the head of an aviator who would try to start his (or her) engine with the rotor tied down or drive off into the sky with the gear down-locks and/or pitot tube covers still in place; but it's done. How much more susceptible is the aviator who doesn't notice that neat, almost form-fitting platform at the base of the rotor mast? "Oh, none would be that dumb!" (I can only refer you to page 26 of the same issue and the nearly countless "page 26s" in previous issues, to say nothing of those in similar publications, ad nauseam. Everyone knows what I mean.) The streamer will not prevent mishap, but it might help by simply attracting attention to something that is "not right."

Lewis W. Stone
Research Psychologist
USAARL
Ft. Rucker, AL

THREAT

"War is one of the constants of history and has not diminished with civilization or democracy. In the last 3,431 years of recorded history only 270 have seen no war . . . . Peace is an unstable equilibrium which can be preserved only by acknowledged supremacy or equal power."

Will and Ariel Durant
The Lessons of History

The WARSAW PACT: 6′6″ and Growing

Major Forrest D. Williams
Threat Branch
Directorate of Combat Developments
U. S. Army Aviation Center
Fort Rucker, AL

NEVER BEFORE HAS the above quotation been more applicable than in Europe today. Here, the most formidable armies in the history of mankind oppose one another. They enjoy this status not only due to brute manpower, but also to the most awesome weapons in history, created out of recent tremendous gains in technological capabilities. These armies are formed by the countries in the North Atlantic Treaty Organization (NATO), including the United States, and those in the Warsaw Pact (WP), including the Soviet Union. It is this latter body, the Warsaw Pact and its Soviet contingent, that pose an enormous threat to the free countries of Europe and, particularly, to the United States and its Army in Europe. More importantly, the Pact, already rich in personnel and materiel, is continuing to improve and modernize its forces beyond what is needed for defensive purposes.

The formation of the Warsaw Pact stems primarily from the perceived need by the Soviet Union to protect its vital interests in Central Europe. For it is in this area, prized for its political, economic, military and cultural significance, that the security interests of the United States and the Soviet Union converge. Thus, in the city of Warsaw in 1955, the countries of the Soviet Union, Poland, East Germany, Czechoslovakia, Hungary, Romania, Bulgaria and Albania entered into the Warsaw Pact Treaty (figure 1, page 34).

The primary purpose the Soviet Union had in establishing the treaty, as in the NATO alliance, was and still is, to deter aggression from any foreign force. However, there are obvious and drastic differences between the NATO alliance and the Warsaw Pact. For instance, only the WP has compulsory membership. And, tied to this latter point, only the WP Treaty has a secondary purpose of being directed inward for the maintenance of Soviet domination over its Eastern European satellites. Thus, the crushing of Hungary's attempted secession in 1956 (1 year after the Pact Treaty) and the stopping of the uprising in Czechoslovakia in 1968 (which caused Albania to withdraw from the Pact) illustrate clearly the prowess of Soviet troops stationed throughout the Warsaw Pact to maintain internal order when directed by Moscow. Even as this article is being written, it appears that the Soviet Union is preparing for yet another invasion—that of Poland.

The obvious primary purpose of the Pact, however, as seen by the Soviets, is the deterrence of aggression from the West. Recalling the importance of the central sector to the Soviet Union, the WP has formed about 58 divisions in this area, compared to NATO's 36. It is also in this area that the Soviet Union has placed its most elite divisions.

When comparing the alignment of forces in the central region (figure 2, page 34), several facts stand out. First, although the number of divisions greatly differ, total manpower is about equal since NATO's divisions contain more personnel, many of whom are dedicated to logistical support. Second, the United States contributes a much smaller percentage of NATO forces. This, in fact, is another great difference between the NATO alliance and the Warsaw Pact—the Soviet Union contributes about 60 percent of overall force structure and is the only nuclear power within the Pact. Conversely, the United States contributes roughly

FIGURE 1:
NATO/WP Divisions in Central Region

NATO		Warsaw Pact	
In Germany:		In Czechoslovakia:	
Belgium	2	Czechoslovakia	10
Britain	4	Soviet	7
France	3	Total	17
U.S.	4		
W. Germ.	11	In East Germany:	
Total	24	E. Germany	6
		Soviet	20
Elsewhere:		Total	26
Belgium	1		
France	8	In Poland:	
Netherlands	2	Polish	13
Total	12	Soviet	2
		Total	15
GRAND TOTAL:		GRAND TOTAL:	
Divisions	35	Divisions	58
Manpower	802,000	Manpower	900,000
Total U.S.:		Total Soviet:	
Divisions	4	Divisions	29
Manpower	160,000	Manpower	475,000

FIGURE 2: European Blocs

one-fifth of NATO's forces and is one of several nuclear powers, to include France and the United Kingdom. In this regard, though, France has several divisions listed on the chart which are no longer under NATO military authority. Without these forces the balance in the overall central region would be even more favorable to the Soviet Union/Warsaw Pact.

More pertinent to U.S. Army, Europe (USAREUR), however, are the forces directly opposing V and VII Corps. For it is here, as was mentioned, that the Soviet Union has concentrated not only its most numerous, but its best-trained and most modernly equipped divisions. This primary threat to USAREUR is the Group Soviet Forces, Germany (GSFG). The GSFG consists of three tank armies (1st and 2d Tank Armies, 3d Shock Army) and two motorized rifle armies (8th and 20th Guards Armies), as shown on figure 3. Composed of 20 divisions these five armies contain about 370,000 men; 8,000 tanks; and 2,500 infantry fighting vehicles (BMPs). Also, the 16th Tactical Air Army supports GSFG with about 900 first-line tactical aircraft, including almost 300 attack helicopters.

Alone, these numbers are impressive. However, when one considers that the Soviet Union equips the GSFG with the most sophisticated combat equipment in its arsenal, the numbers assume an even greater magnitude. This equipment cuts across virtually every aspect of army materiel, including combat vehicles (tanks and APCs), surface-to-air missiles (SAM), anti-aircraft artillery (AAA), antitank guided missiles (ATGM), artillery, combat helicopters and tactical aircraft. Also included are new tactical surface-to-surface missiles capable of nuclear/chemical delivery and having better range and accuracy than ever before. In this endeavor, during the last decade, the Soviet Union has spent vast sums of money (at great expense to its people) to modernize virtually all classes of systems. (These systems have been described in previous *Aviation Digest* articles. For copies write Editor, *U.S. Army Aviation Digest,* P.O. Drawer P, Ft. Rucker, AL 36362.)

In essence, GSFG is an elite group of forces that is the pride of the motherland. It is no wonder that they can ably fulfill the dual purpose of the Warsaw Pact Treaty. Not only have they been able to enforce Soviet domination, but they also possess more defensive capability than ever before. More importantly, though, the forces now have an offensive capability, due to continuous modernization, that NATO has never before confronted.

Because of exact geographic and historical factors, military planners envision that these forces would use this offensive capability to attack through three invasion routes. As shown in figure 4, these routes include the Fulda Gap, the Hof Corridor and the North German

FIGURE 3: Group of Soviet Forces, Germany (GSFG)

Headquarters	Zossen-Wunsdorf
16th Air Army	Zossen-Wunsdorf
34th Artillery Division	Potsdam
1st Guards Tank Army	Dresden
6th Guards Tank Division	Lutherstadt-Wittenberg
7th Guards Tank Division	Dessau-Rosslau
9th Tank Division	Riesa
11th Guards Tank Division	Dresden-Klotzsche
27th Guards Motorized Rifle Division	Halle
2nd Guards Army	Furstenberg
16th Guards Tank Division	Neustrelitz
21st Motorized Rifle Division	Perleberg
25th Tank Division	Vogelsang/Berlin
94th Guards Motorized Rifle Division	Schwerin
3d Shock Army	Magdeburg
10th Guards Tank Division	Krampnitz
12th Guards Tank Division	Neuruppin
47th Guards Tank Division	Hillersleben (Altmark)
207th Guards Motorized Rifle Division	Stendal
8th Guards Army	Weimar-Nohra
79th Guards Tank Division	Jena
20th Guards Motorized Rifle Division	Grimma
39th Guards Motorized Rifle Division	Ohrdruf/Thur
57th Guards Motorized Rifle Division	Naumburg/Soale
20th Guards Army	Eberswalde
6th Guards Motorized Rifle Division	Bernau
14th Guards Motorized Rifle Division	Juterbog
35th Motorized Rifle Division	Doberitz

Plain. When comparing these routes with the disposition of GSFG, it becomes painfully obvious that GSFG, with its massive combat power and capability for sustained action in nuclear or conventional battlefields, will spearhead any invasion from the East. Most of this attack would be directed at USAREUR units. And the favorable combat ratios afforded the Soviet Union through these forward-based units could provide ample opportunity to attack with little or no buildup.

It is due to this powerful and increasing capability that we credit the Soviet Union/Warsaw Pact with great stature; in fact, we, as threat analysts, are sometimes accused of painting our adversaries "10 feet tall." Such is not our position. However, given their present disposition and their additional tendency to continually upgrade their offensive capability, we do say that they are "6'6" and growing." It is to this growing trend and resultant offensive Soviet capability that NATO, and USAREUR, owe their existence. And it is against this threat that NATO and USAREUR must be prepared to defend. To do less might add even further to the veracity of Durant's quote at the outset of this article.

Questions on this or other threat matters may be addressed to the following: Directorate of Combat Developments, ATTN: ATZQ-D-CT (Threat Branch), Ft. Rucker, AL 36362; or AUTOVON 558-5671/3506.

FEBRUARY 1981

FIGURE 4: Primary GSFC Attack Routes

Psychological disturbance can turn something simple into a major task. Your body is trying to cope with the disturbance; therefore, it's hard to concentrate on the task. Lack of attention can cause you to have a fatal accident — don't let this happen!

KNOW YOUR AVIATORS

a human factors approach to Aviation Accident Prevention

Constance Sue Gibson
U.S. Army Safety Center
Fort Rucker, AL

ARMY AVIATORS are a select group of highly competent, healthy (physiologically and psychologically) professionals skilled at handling high-stress situations and making quick, accurate judgments of the life-or-death variety daily. However, every year some of them, through their own errors, manage to kill themselves in an aircraft accident. *Aviation safety officers and flight surgeons can help minimize these pilot-error accidents by helping to recognize psychological disturbances in the aviator.* **Some causes, symptoms and ways these accidents can be decreased are discussed below.**

Doctors T. H. Holmes and R. H. Rahe developed a hypothesis that basically says, "If your life situation requires a *high number of changes,* **good or bad, your chances for developing an illness are much higher than someone whose life has very little change." They tested their hypothesis and found it to be correct. After this, the Social Readjustment Rating Scale (see figure) was developed to predict physical illness and determine situations that can cause high stress leading to psychological disturbances. See how you rate on this scale by adding up the value of life crisis units for life events experienced in a 2-year period. If your score is 0 to 150 — no significant problems; 150 to 199 — mild life crisis (33 percent chance of illness); 200 to 299 — moderate life crisis (50 percent chance of illness); 300 or over — major life crisis (80 percent chance of illness).**

The Army aviator deals with many stressful events that may be cumulative on a routine basis. Remember, a person suffering from a high life crisis unit (for example, divorce or death of a close family member) may be thrown into the danger area for developing psychological disturbances and this could affect

the person's performance. Let's look at some symptoms and ways to prevent psychological disturbances on the ground instead of at the accident investigation.

Symptoms. Since we are aware of events (listed in the figure) that can cause psychological disturbances, we'll discuss some of the more common symptoms displayed by those who are suffering from them. Psychologists use technical terms to describe ways in which people react to stressful situations, but we'll use some "real world" terms. Some major danger signals of psychological disturbances that the aviation safety officer and flight surgeon should be on the alert for are outlined below.

- *Major personality change.* It isn't difficult to recognize a psychological problem in the even-tempered aviator. Just look for unreasonable amounts of anger or irritability and a positive change in personality. If the quiet, reserved aviator suddenly becomes the life of the party, full of stories and continual good cheer, this pilot may be masking a serious life crisis.
- *Change in appearance.* Don't ignore the possibility of high stress if the well-dressed, clean-shaven aviator suddenly becomes sloppy and uncaring.
- *Change in drinking habits.* Drinking heavily is a danger sign because alcohol is used often to gain temporary relief from stress.
- *Psychological change (fatigue and loss of weight).* You can expect an aviator that puts in a 16-hour day to look and act tired the next day. However, be alert when one is tired and haggard day after day with no apparent physical reason because anxiety and depression can cause sleepless nights. Never ignore "unplanned" loss of weight caused by lack of appetite or anxiety. This is a major symptom of psychological disturbance.

Now that we know some of the things that cause a psychological disturbance, let's see what aviation safety officers and flight surgeons can do to help prevent them!

Prevention. What should safety officers and flight surgeons do to prevent the aviator's performance from being hindered and possibly causing an accident? We can't just walk up to the person and say, "I don't think you should fly in your condition." That wouldn't be very smart and might prove dangerous — if you know what I mean! But, there are things we can do and suggestions we can make that might help prevent an accident.

One of the most important things we can do is to *educate all levels of the organization* on points just covered. It is imperative that the unit's key officers be aware of stresses their aviators are under. The commander and operations officers can alleviate some of the stressful situations and keep the aviator that has a problem out of trouble by approving a few days off or not *assigning* difficult missions.

The aviation safety officer should be aware of things happening to each aviator in the unit. The safety officer should keep in close contact with the aviator and maintain a rapport that allows freedom to confide and trust. The safety officer also should have this same type relationship with the commander. If this relationship exists, the commander will trust the safety officer's judgment and act upon it when there is a suggestion for change of mission or a request for unscheduled leave.

Social Readjustment Rating Scale

Rank	Life event	Mean Value
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
4	Jail term	63
5	Death of close family member	63
6	Personal injury or illness	53
7	Marriage	50
8	Fired at work	47
9	Marital reconciliation	45
10	Retirement	45
11	Changes in health of family member	44
12	Pregnancy	40
13	Sex difficulties	39
14	Gain of new family member	39
15	Business readjustment	39
16	Change in financial state	38
17	Death of close friend	37
18	Change to different line of work	36
19	Change in number of arguments with spouse	35
20	Mortgage more than $10,000	31
21	Foreclosure of mortgage or loan	30
22	Change in work responsibilities	29
23	Son or daughter leaving home	29
24	Trouble with in-laws	29
25	Outstanding personal achievement	28
26	Wife begins or stops work	26
27	Begin or end school	26
28	Change in living conditions	25
29	Revision of personal habits	24
30	Trouble with boss	23
31	Change in work hours or conditions	20
32	Change in residence	20
33	Change in school	20
34	Change in recreation	19
35	Change in church activities	19
36	Change in social activities	18
37	Mortgage or loan less than $10,000	17
38	Change in sleeping habits	16
39	Change in number of family get-togethers	15
40	Change in eating habits	15
41	Vacation	13
42	Christmas	12
43	Minor violations of the law	11

Reprinted from *Aviation Digest* November 1975

HELLO DOLLY

G.T. "Wes" Gosling
and
Arnold Mosblech

Military Traffic Management Command
Transportation Engineering Agency
Newport News, VA

SOMETIME AGO, the authors had to work with a stow plan, a diagram of how Army helicopters were to be loaded into the hold of a roll-on, roll-off ship for a trip overseas. The aircraft were shown packed in, mostly head-to-tail like sardines in a can but with some tucked in at odd angles or jammed into a corner to use every available inch of space.

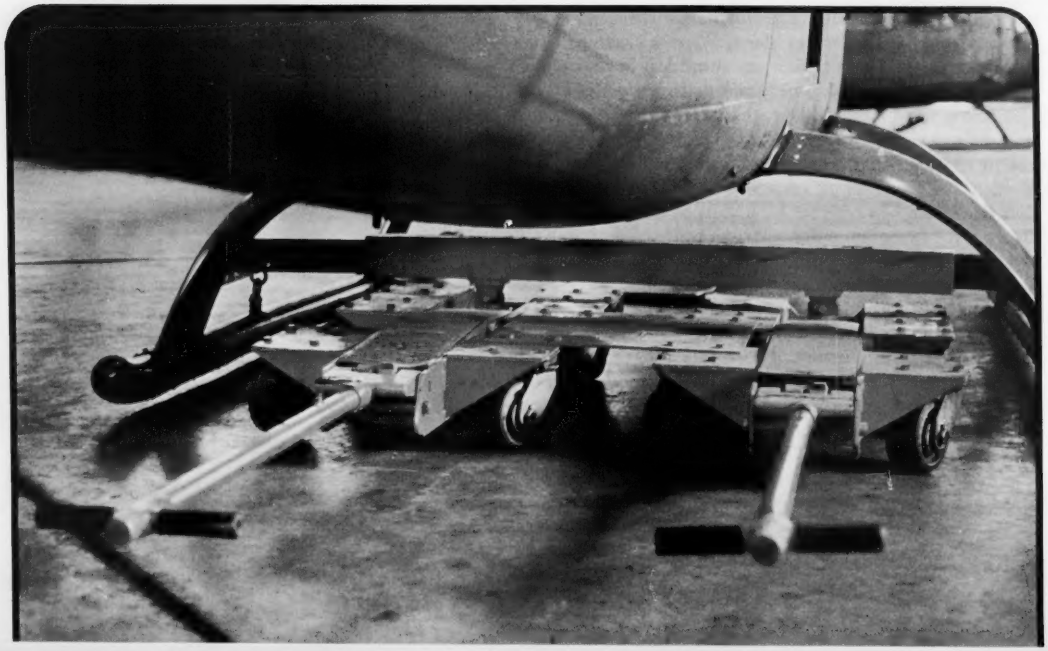
What the plan did not show was how to get the 3 to 4 ton helicopters into such positions!

Of course, those that have skids rather than landing wheels, such as the UH-1 Huey and AH-1 Cobra, can be fitted with auxiliary ground-handling wheels. These pneumatic-tired wheels are equipped with a small hydraulic jack and, when attached to fittings on the skid tubes, can raise the aircraft a few inches, making it like a two-wheeled trailer so it can be towed around in hangars or across the ramp area. That works fine when there is plenty of maneuvering room but not so well in tight places because helicopters can't be moved sideways or "crab-angled" or spun on a dime.

The officer who devised that particular plan said, "We can get the 'copters as close as possible to the required location by using the ground-handling wheels and then, with enough people-power, maybe we can push, pull or lift them the rest of the way."

Well, it doesn't take an Einstein to figure out that if one man can lift about 80 pounds without getting a hernia, 100 men would be needed

Auxiliary ground handling wheels positioned under a UH-1



Inspector checks UH-1 clearance from skid to ground after Huey was raised

to lift an 8,000-pound Cobra. They'd have to stand on top of each other just to get close enough to touch it, let alone grab hold of some substantial part that could be used as a hand-hold for lifting or pushing!

"Alright already," said the major. "So invent something that will do the job!"

The problem: Build a device that will lift a 4-ton helicopter about 4 inches and move it in any direction on a fairly smooth surface. The device must not be wider than the aircraft itself (at the landing skids) and must not get stuck by small obstacles such as gratings, lapped deck plates, or gravel, bolts and other trash on the deck. Also the device must not damage the aircraft in any way.

At first glance, that ought to be a fairly simple assignment. Just put a heavy-duty jack on a low platform with swivel casters under it, attach a U-shaped, padded cradle to the jack, and pick up the helicopter under its belly at the approximate balance point, right? Wrong.

The exterior covering of a helicopter is thin and fragile. Any concentrated pressure would not only dent or puncture the "skin" but would also dent, damage or rupture whatever component is just inside the skin at that location. Furthermore, the belly area of a helicopter is far from being a smooth surface—there are numerous protrusions that stick down below the belly, such as vent tubes, overflow tubes, cargo hook, antenna fittings, etc. These items are not readily discernable to the casual observer, but they are there. Right away we forgot about lifting the helicopter with a padded cradle.

So we invented. We considered all kinds of principles and devices that could be adapted for lifting a helicopter and moving or turning it. Hydraulic rams, pallet trucks, machinery rollers, lever devices, transmission jacks, hydraulic work platforms, scissors jacks, screw jacks, etc. All were considered either singly or in combinations, as purchased or with modifications, with and without special frames, brackets, wheels, casters, or other adapters or accessories.

One by one, each of these ideas or devices was discarded: too expensive; needs too much modifying to make it feasible; too complex to operate; can't lift that much weight; too high. (Note: the Huey has only about 13 inches of clearance under the belly, so the device can't be much more than 12 inches high!). It was also determined that the *only* points at which a helicopter can safely be lifted are the attachment lugs on the skids to which the ground-handling wheels may be fastened. That settled the "where" portion of the problem. The "how" was still not solved.

Eventually we settled on the following: Take two hydraulic service jacks of the type you find in almost any auto repair shop—you know, the long, narrow jobbies on small wheels, with a long handle like on the old push-type lawnmower. Remove those small wheels from each jack and replace them with six large (6-inch diameter) heavy-duty casters. Of course, large mounting brackets must first be made and welded to the jacks so there is a place to attach the bigger wheels. Now place the two jacks side by side, about 3 feet apart, and bolt a steel plate across them, thus fastening the two jacks together to make a single unit or dolly. Next place a 5-foot-long square (hollow) steel beam crossways, so it rests on the lifting saddles of the two jacks, and fasten it there. Put two extension bars inside the hollow beam, so that one bar slides out to the right, the other to the left, and attach some shackles to the outboard end of the extensions.

To operate this gizwidget (formal title: Helicopter Positioning Device), center it under the tail of the helicopter, with the two side-by-side jack handles lowered almost to the ground and pointing aft. Now, roll the device forward until the crossways square beam passes under the arched landing gear crosstube. When the square beam is under the balance point of the helicopter (directly below the hub or shaft of the rotor blades), pull out the extension bars so the ends with the shackles are just over the skids of the helicopter, and attach the shackles to the handy little lugs at the top of the skids. Next get two people to pump the jack handles (more or less in unison) until the helicopter skids are 3 or 4 inches off the ground, while another willing volunteer pulls down on the tail skid to keep the helicopter about level. With 4 or 5 people pushing, the aircraft can now be moved or turned in any direction, just like the swivel chair behind the boss' desk. See?

One more thing. Since the UH-60 Black Hawk has become operational, we had to modify our dollies (four have been built, so far) to fit this aircraft, too. The Black Hawk does have landing wheels, not skids. But it still won't move sideways unless we pick it up with our handy dandy little spotting dolly. These dollies also would be handy for packing many helicopters into a hangar when severe weather, such as a hurricane, is forecast for an area.

For more information about the Helicopter Positioning Device, write the authors at Military Traffic Management Command, Transportation Engineering Agency, P.O. Box 6276, Newport News, VA 23606 or duty phone: AUTOVON 927-4646.

MONTHLY WRITING AWARD

EXPERIENCE ik-'spir-ē-ən(t)s: A. the usual conscious perception or apprehension of reality or of an external, bodily or psychic event; B. something personally encountered, undergone or lived through; C. fear

CW2 T. Cowart
Operations Officer
HHC, 197th Infantry Brigade (SEP)
Fort Benning, GA

Thanks, D. Webster.

When do we discover just how valuable our experience as an aviator is? My answer is that we discover how valuable experience is when we will admit to ourselves that we don't know all there is to know about flying.

Experience is:

☐ Realizing the checklist is for everybody and not everybody else.

☐ Feeling a bump in the rotor system during runup and being absolutely certain it was caused by a gust of wind—but shutting down just to take a look anyway.

☐ Knowing that the engine surges you just felt were pilot induced by abrupt power changes, but thinking that they may have originated in the governor assembly.

☐ Knowing that sooner or later something is going to go wrong and hoping that you are ready instead of feeling omnipotent; all powerful.

☐ Asking the instructor pilot for some time to fly with him even though your checkride is months away.

☐ Not hesitating to ask the dumb question.

☐ Knowing that you are susceptible to vertigo and not pushing yourself to the limit.

☐ Taking your FLIPs (flight information publications) on a VFR (visual flight rules) flight, not needing them, but being glad you had them—just in case.

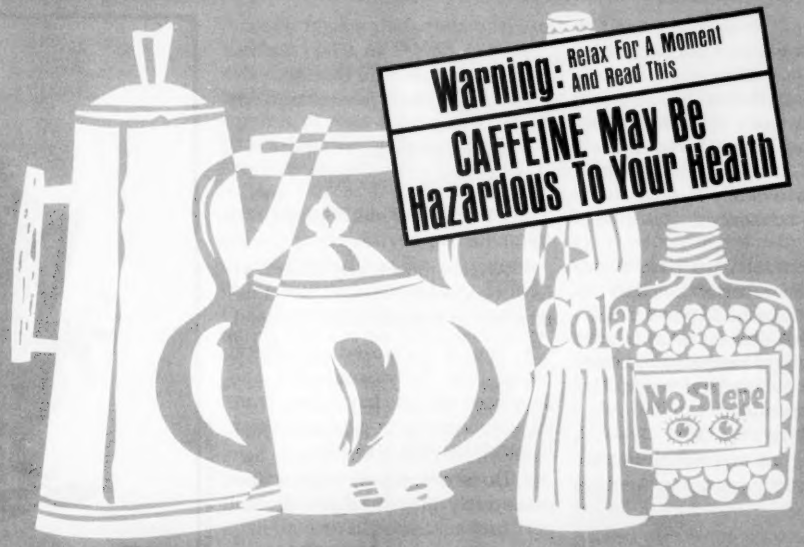
☐ Looking back to some particularly stupid thing you did and promising yourself that you will *never* do that again, and keeping your promise.

☐ Evaluating your ability to perform a mission and asking for help if you think you need it.

☐ Landing 2 miles from the airfield with a caution light that is probably just a loose wire. To scatter yourself, your crew and your flying machine across the countryside doesn't take experience, but to bring it all back in one piece often takes all the experience you have and some you may develop in the process.

Experience is trying to convince your kids that it isn't easy to grow old and that they should be sure and listen to those who will give advice because the advisor's experience (like theirs) is—after all—the best teacher.

The *Aviation Digest* would like to thank *Aerospace Safety* for permission to reprint this article



Caffeine

Drug Of Abuse In The Eighties?

Colonel Richard B. Pilmer

Colonel Pilmer is chief of the Aerospace Physiology Branch, USAF School of Aerospace Medicine, Brooks AFB, TX. He has a master's degree in health education from UCLA and a Ph.D. in physiology from Ohio State. COL Pilmer, as an aerospace physiologist, is well aware of the stresses which take place in the aviation environment. The ability of each aviator and crewmember to cope not only with these aviation stresses but also those self-imposed stresses to which we subject ourselves is extremely important. The effects of self-imposed stress such as caffeine to a great extent cannot be quantified for each individual, since everyone is so different; but each aviator and crewmember needs to seriously consider self-imposed stress and how it may affect your performance in the aviation environment.

FOR QUITE SOME time now during AFR 50-27 aerospace physiology refresher training, students have responded to lectures relating to drugs and "self-imposed stress" with the question: What about caffeine?

Subsequently, we embarked upon a two-phase study to review available scientific information in relation to the toxicology and physiology of the drug caffeine, and to determine the actual caffeine practices of our students by means of an objective questionnaire. The results of this survey will provide the readers an opportunity to examine their practices in relation to our sample population of aircrewmembers.

We found that about 80 percent consumed coffee in some form with about 26 percent at the 3 to 4 cups per day level, 17 percent at the 5 to 6 cups per day and about 8 percent at more than 7 cups per day. The majority consumed regular coffee brewed at average strength sweetened with sugar. Only 7 percent were regular saccharin users and less than 2 percent used cyclamates.

Like our crewmembers, many people regard caffeine as a safe, legal stimulant without great regard for the quantity of their consumption. While the caffeine-loaded beverages, food and drugs they ingest are an expensive part of their lifestyles, most of the "users" have paid little attention to their daily dose, or the degree of their (addiction)

involvement. There is no need to be sanctimonious or presumptuous about the possible hazard of using too much caffeine. Moderation always has been regarded as an important rule for all practices.

Modern biochemists identify xanthines as a family of compounds comprising humanity's oldest stimulants.

When extracted in pure form, caffeine, a member of the xanthine family, is a shiny white powder. This weak base alkaloid is closely related biochemically to morphine, nicotine, cocaine, purines and strychnine. The structural formula:

$C_8 H_{10} N_4 O_2$

with minor arrangements of the methyl groups, accounts for the three principal forms of methylated xanthines or caffeine shown below in the figure.

Of these forms, caffeine, and its most prevalent source, coffee, are popular throughout the world.

The Physiology of Caffeine

CAFFEINE—This drug is described as nonadaptive (regular use does not diminish its stimulating effects). It is not physically addicting in the sense that withdrawal will harm, or produce violent symptoms. It does seem to be psychologically addicting, and not easily discontinued. Some tolerance is evident in that it takes more to get the same effect with continued use. Humans tend to increase its use with age.* Many use it to keep their weight down.

A POWERFUL CNS (central nervous system) STIMULANT—Here are key descriptive characteristics:

- Antidepressant.
- Stimulant, analeptic.
- Maintains wakefulness (antihypnoid).
- Affects muscles by central affect (theobromine | cocoa | has greatest affect on isolated skeletal muscle).
- Causes increased peripheral blood flow by vasodilation and decreased cerebral blood flow (cranial vasoconstrictor and reduction in cerebrospinal pressure).
- Does not significantly affect objectively measured intellectual performance.
- Does affect speed of accomplishment of motor tasks significantly, up to an individual dose level.
- Tolerance is slow to develop and slow to disappear (may require more than 2 months of abstinence).

Exactly how caffeine works is largely unknown, but one theory holds that it inhibits phosphodiesterase with a resultant increase in tissue 3' to 5' AMP; 3' to 5' AMP is an intracellular intermediate which increases the rate of hormonal reactions. While the mechanism is not entirely clear, it also plays a role in the vigor of muscular contraction by affecting the release of calcium from intracellular stores.

Cartoons by Al Young

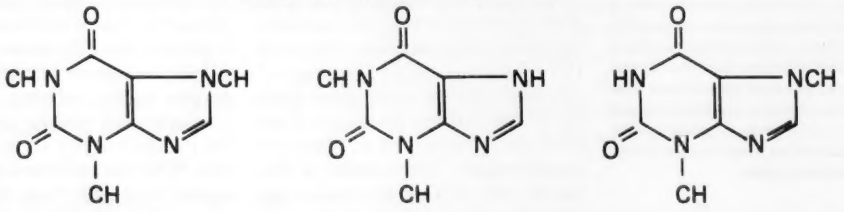
How Can You Tell If You're Really Hooked?

If you find this article with coffee stains on the first page untidily stashed in the trash can, it may mean that you or the reader, undesirable of being objective about coffee, are really hooked. There is also a strong possibility that the individual also smokes, consumes alcohol regularly, and finally, is not a small percentage of the population!

But that individual is not you; you are still reading! You are a rational, objective person willing to appraise your own caffeine con-

*By one survey, American coffee consumption in excess of 7 cups/day is higher in 40- to 49-year old people.

Three principal forms of methylated xanthines



Coffee
Molecular Weight: 194.19

Tea

Cocoa
(Lesser effect on CNS)

sumption practices. The next step will be considerably tougher however. It should *not* be attempted when you face a situation that demands your top performance (i.e., before a long drive at night on the highways or similar flight in the airways).

If you consume five cups (or more) of coffee every day (or equivalent), are blessed by a vacation-like pause in your routine (no great demands on your performance), try absolute abstinence from caffeine. This means no coffee, coke, tea, APCs, cold pills, chocolate or foods containing caffeine, for at least 24 hours. After this time of abstinence, subjectively note your symptoms, and set out for another caffeine-free 24-hour period. It will take about 7 days of this to "clear" the caffeine from your system. The drug withdrawal symptoms are not widely known because very few people have tried the experiment, and fewer yet have completed it! If you find that you can go long periods without caffeine, you were probably not physiologically addicted. One word of caution, however, when withdrawing from caffeine count your calories because you may tend to put on weight!

After 12 to 18 hours you may note headaches (widely reported) and a general restlessness, disquiet, anguish, or even aching pains. Dysphoria describes the variable human response to caffeine withdrawal.

Some will complete the withdrawal with very little ill-effect, but they are of the minority in belonging to a group who partake of caffeine only on an occasional basis. (Their total previous caffeine consumption during 24 hours has probably averaged less than about 100 mg, or the equivalent of one cup of coffee.)

If you regularly suffer from any of the following symptoms, you have even greater cause to evaluate your caffeine intake practices. All of the following symptoms have been attributed to regular consumption of large doses of caffeine:

- Insomnia*
- Sense of dread, depression
- Anxiety*
- Fatigue*
- Loss of balance*
- Faulty thinking*
- Finger tremor
- Increased reaction time*

In Terms of Performance Today, or Longevity Tomorrow, How Much is too Much?

For Americans in general, the rank order for contributing caffeine to their systems is coffee, tea and colas. The drug is routinely removed during the processing of all coffee. The greatest to the least amount of caffeine among the various forms of coffee can be listed as follows:

- Regular
- Instant
- Decaffeinated Regular
- Decaffeinated Instant

Ironically, the caffeine that people pay to have removed from their coffee is purchased by themselves or others in drugs that have caffeine added, since decaffeination provides a major source of caffeine for the chemical and drug industries. It is also made synthetically.

*More directly related to safety

Although probably benign when used in low dose levels, there is increasing interest that caffeine in accumulated high ingestion levels may be related to a variety of acute and chronic nervous and physical conditions. It is also possible that at relatively low doses it serves as a cocarcinogenic agent. Because so many people ingest caffeine from a variety of sources, and because there are also more artificial flavors and colors in foods, additional work is needed to more clearly define possible interactions. Environmental factors involving radiation, air and water pollutants, and industrial by-products, add to the complexity of the problem.

The approximate values of caffeine per average size cup (6 oz).(It is realized that some variations will occur in relation to strength of brew.)

Coffee	100 mg/cup
Instant Coffee	60 mg/cup
Decaffeinated	3 mg/cup
Tea (theophylline)	75 mg/cup
Instant Tea	30 mg/cup
Cocoa	6-40 mg/cup caffeine 200 mg/cup theobromine
Cola	60 mg/cup

In regular coffee the method of preparation causes considerable variation in strength

Automatic	15 mg/cup
Dripolator	142 mg/cup
Electric perk	104 mg/cup

In general, caffeine content relates to the highest grind or the smallest leaf parts (tea).

Finally, because drugs are used so widely, it is important to realize that there is great interaction between the xanthines and other drugs. It is possible that some of these at low dose levels have beneficial effects. While it could probably be said that ideally, in a regime of natural living, we would live and enjoy better health without caffeine, it is possible that since caffeine is a natural compound, and because we have most likely adapted to it, it may be that it exerts beneficial physiological effects at low doses.

Since the mid-seventies, there has been increasing interest in caffeine's possible mutagenic effects. At levels of caffeine possible as a result of high content beverage consumption (or dose equivalent amounts provided to animals in feed or water), caffeine has been studied with regard to possible effects on DNA or the chemical substance of chromosomes.

It may slow the repair of DNA damaged by ultraviolet radiation, or it may affect change of DNA by other carcinogens (cocarcinogenesis). How caffeine might affect repair or rate of synthesis of DNA is related to the structural similarity of caffeine to adenine and quanine. Both are important building blocks of the DNA molecule. It does not form a stable bond in DNA substitution, but its potential for cocarcinogenic interaction is real.

While little is known of plant caffeine physiology, high doses cause chromosomal breakage in plant cells, microbes, paramecium aurelia and others. Caffeine affects older cells more rapidly than younger ones. While en vitro culture results cannot be directly attributed to en vivo, it has been observed that humans tend to consume more coffee with advancing age.*

Dose levels are extremely important to these relationships and results are as yet inconclusive. There is reason for concern, however.

How Does the Use of Caffeine Relate to Performance, Safety and Mental Health?

If individuals become depressed because of work, or other environmental factors, the result may lead to the initial use of caffeine and other drugs. With the present condition of the world, and the uncertain stresses encountered, it is no wonder that the American adult population is about 85 percent involved with caffeine. The degree of the problem, probably as throughout all of toxicology, relates to the dose and the total time of involvement. The average plasma level then, and the length of involvement, would relate to the possible pathology. Because we are constantly bombarded with "take this for pain, take that for indigestion" (i.e., Excedrin 65 mg/tab., Antacids 50 mg/tab., Bromo Seltzer 32.5 mg/cap.), so that the total daily caffeine intake may increase to the point where it affects performance (safety) and mental health.

Coffee, Tobacco and Alcohol

There are great difficulties in attempting to isolate caffeine as an affector of human physiology (and pathology), in that smoking and drinking habits are covariates—persons indulging in one are more likely to partake of the other. The role of cocarcinogens is biochemically very complex, and an important role of future science will be to determine interactions among substances.

It is interesting that only about 4 percent of heavy smokers drink no coffee. Among individuals smoking better than a pack a day, about 40 percent drink more than six cups of coffee per day.

There may be an underlying physiological reason for this pattern. It has been noted that coffee-drinking cigarette smokers take more nicotine into their systems when they ingest no caffeine. Also, as measured in saliva and urine, this increased clearance of caffeine is seen in smokers. This process has been tentatively identified with induction of an enzyme in the liver (hepatic arylhydrocarbon hydroxylase). Since caffeine is a circulatory dilator and nicotine a constrictor, the pharmacological reciprocal relationship may somewhat mechanically explain one affecting clearance of the other.

*There is a positive correlation for coffee drinking (women more than men) and cancer of the bladder in people more than 60 years old. There may be a risk associated with even small amounts of caffeine. This applies to the urinary tract and the prostate gland.

Both relate to increased catecholamine production when taken independently. Also, withdrawal from caffeine or nicotine lowers epinephrine—norephinephrine levels which results in lassitude, headaches or irritability.

There seems to be a synergism between cholesterol levels in simultaneous users, but coffee drinking alone does not appear to significantly affect blood lipids.

The relationship of caffeine to heart disease and cardiovascular problems seems to be a weak one when considered by itself. While more than three drinks (alcohol) per day is significantly correlated with hypertension, this is independent of age, race-ethnic, sex, smoke, coffee, adiposity or education.

While it has already been stated that people who use alcohol also use coffee and smoke, there is a stronger association between alcohol and smoking than alcohol and coffee use. Also, the use of tea seems to stand entirely by itself. . . .

While it has been noted that caffeine may be related to cardiovascular problems or accidents because of sleep deprivation, this would tend to identify with caffeine addicts more than alcoholics, who more frequently arise early, drink coffee until about 2:00 p.m. and shortly begin their evening alcohol participation.

The physical symptoms of cardiac arrhythmias, ectopic beats atrial-tachycardia, are more likely to occur in individuals who are tired and also under the influence of stimulants.

Summary

Aircrewmembers should realize that coffee is not a harmless beverage that can be safely consumed in unlimited quantities. They should review their present caffeine consumption levels and set realistic goals of abstinence or moderation.

More than four cups per day or more than 400 mg in a 24-hour period has been reported as beyond the upper safe limit. For a pregnant woman in her first 12 weeks of gestation, more than 100 mg in 24 hours or less may be unsafe for her baby.

A great deal more needs to be known about caffeine as a possible cocarcinogenic substance. It is highly probable that we will learn more about how serious this problem is during the eighties.

For aircrewmembers it should be emphasized that coffee could be a life saver when moderately consumed at times demanding optimum vigilance. On the other hand, overuse after missions might impair adequate rest and contribute to unnecessary fatigue on the next day's flight. Like most things we associate with the "good life," coffee and caffeine are just being added to the list of things that are probably harmful if abused. Because overuse has been reported to cause loss of balance, decreased cerebral blood flow and slower reaction capabilities, it is possible that aircrewmembers should reevaluate their coffee drinking practices (or total caffeine consumption) before flights in high performance aircraft.

While we know of no studies which relate to spatial disorientation and coffee drinking, it is possible that overuse will be considered as a part of the more general *enviromical** transition into the predicted wellness revolution of the eighties. At any rate, check it out. Physiological checkrides are just as important to the quality and quantity of your life as the cockpit niche you inhabit is concerned with aerospace safety.

*Enviromical is a word that COL Pilmer has coined and he believes will be a quite familiar term by the year 2000. The word is an adjective which describes any process which saves energy, saves money, saves individual health and helps preserve the environment.

Give the. . .

UNITED STATES ARMY
AVIATION DIGEST

FOR FATHER'S DAY

FOR MOTHER'S DAY

Attention Superintendent of Documents
Send the United States Army Aviation Digest to:

name

address

city state zip code

Enclose (check one)
☐ $20.00—domestic
☐ $25.00—overseas
for a one year subscription
and return to:
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

A CHAPTER IN Army Aviation history closes 28 February when the last liaison pilot on active duty, Major General James C. Smith, retires from a military career that spanned almost four decades.

For the past 2 years he has served as director of training, Office of the Deputy Chief of Staff for Operations and Plans, Department of the Army, Washington, DC.

Liaison pilots were the men who earned the silver "L" wings from 1942 to 1950 when the aviator badge was changed to its present configuration. The "L" indicated they had trained in the fixed wing, liaison-type airplanes of those early days; and by virtue of being rated near the beginning of the Army's aviation endeavors, many of those pilots were primary contributors to the growth of the new fighting force.

General Smith's contributions to the Army date from his enlistment in June 1942 and subsequent commission as a Cavalry second lieutenant in January 1943.

His specialized dedication to Army Aviation began in November 1946 when he received his liaison pilot rating at Ft. Sill, OK. He later trained as a helicopter pilot and retires as a dual-rated Master Army Aviator.

At age 57 General Smith has logged more than 6,000 hours on aviation assignments. He has flown as an air observation pilot in Europe, as the command pilot for a three-star general in Korea, and as a unit commander in Vietnam.

He had two tours in Vietnam, January 1966 to April 1967 and August 1968 to July 1970. On the first he was assigned to the 1st Cavalry Division (Airmobile), having served the previous 2 years with the Joint Test and Evaluation Task Force, U.S. Strike Command, MacDill Air Force Base, FL, on the test and evaluation

Major General James C. Smith

LAST LIAISON PILOT RETIRES

L-4 over Post Field, Ft. Sill, OK, original home of Army Aviation

Article by Betty Goodson
Photographs by SP4 Don Chance

Craig Randall

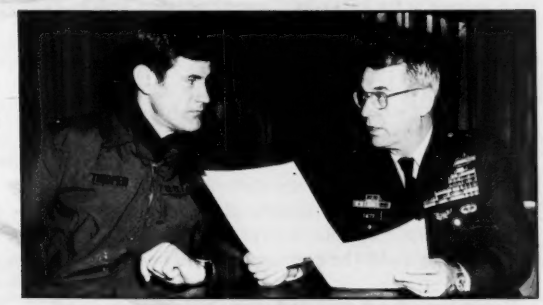
of the 11th Air Assault Division (T), the 1st Cav's forerunner. On the second tour he was deputy commander of the 1st Aviation Brigade and later assistant commander of the 101st Airborne Division.

Other assignments in which he has helped structure and advance Army Aviation were as commander of the 1st Armored Division and later the 1st Cavalry Division, Ft. Hood, TX, from March 1971 to December 1972; as commander of Army Readiness Region V, Ft. Sheridan, IL, from July 1973 to January 1975; as chief of staff, United Nations Command/U.S. Forces Korea/ Eighth U.S. Army, from February 1975 to July 1976; and as commander of the Army Aviation Center, Ft. Rucker, AL, from July 1976 to December 1978.

General Smith can derive satisfaction from knowing he has been involved with many of the accomplishments that have made Army Aviation a major contributor to the Army's strength. But not everything has been done that needs doing, he said:

"The ever-changing technology of warfare means the future holds some exciting challenges for those who are and who will serve in Army Aviation. I believe the way to meet those challenges is through the very best training that can be devised for schools, units and individuals. All of it has to be aimed at preparing to fight the next war."

As he speaks of the future, it is evident that Liaison Pilot Smith has only retired from the Army—not from his role as an advocate of Army Aviation.



Student pilot 2LT James G. Thigpen, left, of the California Army National Guard, receives some advice from a veteran of almost 35 years as an Army aviator, Major General James C. Smith. This occurred shortly before a big event for both officers: General Smith's retirement is scheduled for 28 February and LT. Thigpen's graduation from flight school for 13 February

It's Not Fair; Or Was It?

CW3 Michael Porter

CW3 Porter, a dual rated Senior Army Aviator, is a recent graduate of the Warrant Officer Senior Course, Ft. Rucker, AL. He has served two Vietnam tours and one Germany tour. As a graduate of the Aviation Warrant Officer Advanced Course and the Aviation Safety Officer Course, University of Southern California, CW3 Porter has worked in the field of aviation safety for the past 6 years. He is assigned to the Air Traffic Control Evaluation Activity, Ft. Huachuca, AZ.

ACTUALLY IT wasn't fair! I mean, happily married, two normal healthy children, good assignment, even picked for promotion. It just wasn't fair!

Operations stated that the general had to be at the tactical field site no later than 0730 hours. "It is a very important mission" were the operations officer's very words. "That's why the commander will be flying with you."

I wonder why I have to always fly the general, especially on a Friday? I don't need the experience. Our new pilots need to do this more than I do. I mean, I was a young pilot a few years back and—and anyway, today is my son's birthday. Hope we get back early, Linda will need help with getting everything ready.

Maybe I wasn't looking at the mission right. But after watching that close ball game last night and winning my bet — Oh well, after another cup of coffee I'll head to the flight line. That reminds me, I'm going to have to have one of those father-daughter talks again with Mary. She's still dating that Michael.

Sure wish I lived in a dryer climate, I could ride a bike to work. At least the grass likes this rain. Now where did I put those keys?

The streets are always so empty at this time of morning. I need to buy some fog lights for this car next payday. Well, there is one good thing about this mission, we'll have our best crewchief going with us. If all of our aircraft were in the same shape as his, my preflight time would be a lot shorter all around; especially during these predawn preflights.

Oh great!! I sure hope he has a flashlight. I'm going to have to remind my young son to stop playing with mine. Just think, 6 years old today—before I know it he will be a young man. . . . Anyway, it really isn't that important, I always carry a penlight.

I bet operations appreciates me. Never turning down a mission and always making my takeoff times. Not everybody can say that.

I better remind Linda about the award ceremony Monday. Getting Master Wings is quite an accomplishment. Better get my greens out of the cleaners tonight.

That post snack bar could make more money if they would open earlier. I'm not much for eating early anyway. A couple of doughnuts are all I need. With that flight physical coming up those 5 pounds have got to come off. Better skip lunch and hold off on the cake and ice cream tonight.

As I was telling the commander as we were taking off, the general is lucky to have two pilots with 6,000 flight hours worth of experience sitting in the cockpit. Though it is too bad about the general's headset. With the commander getting the weather briefing, and me preflighting the aircraft we were bound to forget something. At least since the crewchief was late he did swing by the snack bar and pick up some coffee.

If the ceiling were a little higher for approaches, today would be a good day for some instrument training. I guess I could use a little extra training before my instrument ride. It's a good thing our examiner knows me. He really drags out an oral with those young guys. I remember when I had to enter holding and fly using partial panel. Heck, I even remember when flying low level was illegal.

"Yes, sir, I've got the power lines in sight. We'll cross them at the pole."

I remember when our windshield wipers used to scratch our Plexiglas windshields. Now we have glass windshields and it sure helps when using the wipers.

"Sir, I've turned on the searchlight." I always stress turning on the searchlight in reduced visibility. "See and be seen" as the old saying goes. "No, sir, we're right on schedule, just keep your airspeed up."

One of these days they will make a helicopter that doesn't vibrate. Everytime I tune a radio, my map vibrates off my lap; then I have to reach down and . . . "Yes, sir, I see the . . . . . ." It just wasn't fair. I had so much to live for, but anyway, it *was* an important mission—

Fair or not, preoccupation with personal problems, an overestimation of one's abilities, and failure to really sit back and look at the whole picture can—and often does—lead to a tragedy.

Going back and picking out the causes of an accident is important. This data is used to help prevent future accidents. But it is more important for the aircrewmember to be able to pick out the indicators as they appear and break that chain of events which can lead to an accident.

U.S. Army Communications Command
ATC ACTION LINE

ASSIGNMENT – EUROPE

IF YOU HAVE NOT yet been assigned to Europe but have reached that point of your aviation career where you:

- Confidently use flight information publications (FLIP)
- Apply procedures of FLIP general planning (GP)
- Unerringly prepare DD Form 175
- Understand the varied limits of controlled airspace

be not too quickly complacent!

An assignment to Europe will initially confuse and will certainly provide challenges requiring new learning in each of the above listed areas. Help is available from several sources of information. Here are three.

Flight information publications are planning documents, organized to provide a logical approach to proper flight planning in Europe. General data contained in the GP is modified by requirements listed in the area planning (AP) documents. Specifically, the AP/2 provides procedures for consecutively small geographic areas. For example, an aviator concerned with proper preparation of the International Flight Plan (DD Form 1801) used in Europe will find complete general instructions in the GP. Additional requirements are contained in AP/2 under flight planning, first in chapter 1A, "Theater Notices," then in chapter 3, section A, "European Regional Supplementary Procedures," and finally, examples of specific pertinent 1801 flight plans in section C, "National Supplementary Procedures, Germany." This progressive approach from the larger area to smaller, or from theater to regional to national, will always provide the most comprehensive accumulation of useful data. Recognizing unique requirements presented by flight in Europe, the United States Army, Europe (USAREUR) Safety and Standardization Board (USSB) created the USAREUR Aviation Orientation Course which is requisite to performing pilot duties in the command. This directed study effort emphasizes the differences in planning procedures and the major sources of information mentioned here. The primary reference for the course is DOD FLIP AP/2.

The United States Army Flight Operations Detachment (AFOD) described in regional supplementary notices of AP/2 is tasked with providing Army flight services support in the USAREUR area of responsibility. In most respects, AFOD provides services similar to those of the flight service station (FSS) in the continental United States, but specifically the detachment screens flight plans (1801) and monitors air movements to ensure compliance with national and military directives. They provide advisory service and initiate communications searches, coordinating search and rescue when necessary.

The unheralded functions of AFOD, however, bear some elaboration since each aviator will depend on their application regularly. In USAREUR you will find that many of the U. S. Army airfields have only a field phone or intercom and instructions to file with AFOD. AP/2 provides both the commercial (06221-57-6201) and the Heidelberg military (6201) numbers for access to the AFOD switchboard. The operator there will connect callers with weather for 175-1 briefings, notices to airmen (NOTAM) section for current NOTAMs, and then transfer the caller to traffic section to file a flight plan. AFOD operates 24 hours per day, 7 days a week. They have direct access to the Frankfurt BFS (FSS) via teletype for filing instrument flight rules flight plans and relaying aeronautical information. Filing with AFOD is highly recommended; it is the best way to ensure adequate flight following and responsive search and rescue.

The United States Army Aeronautical Services Detachment Europe (USAASDE) is the U. S. Army and European center for aeronautical information—and more important, is the primary source for FLIP, maps and related products; they interpret host nation aviation regulations and evaluate instrument approach procedures for compliance with TERPS (terminal instrument procedures). Aviators should know that in addition to FLIP, related publications such as Federal Aviation Administration handbooks, Airman's Information Manual and foreign clearance guides can be provided by USAASDE. Special chart requirements and questions regarding maintenance of unit FLIP accounts should be addressed to USAASDE via Comm Card, or telephone at Heidelberg Military 6426.

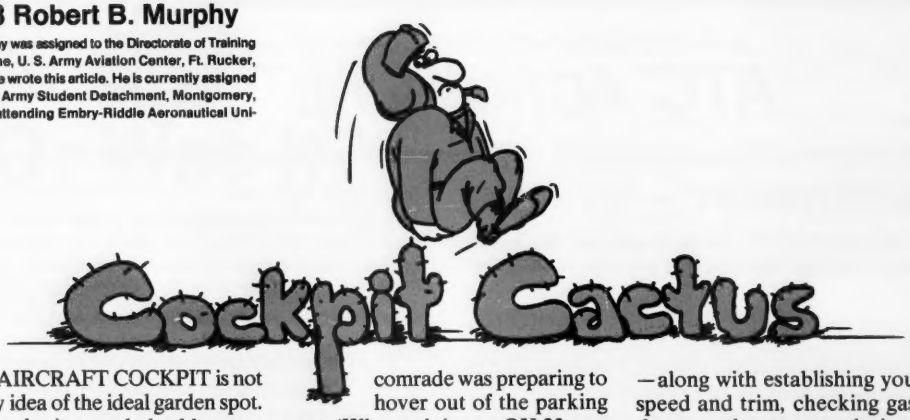
Transient aviators at Heidelberg Army Airfield are encouraged to visit both AFOD and USAASDE for tours of the respective facilities and to discuss any facet of aeronautical information.

Readers are encouraged to address matters concerning air traffic control to:

Director
USAATCA Aeronautical Services Office
Cameron Station, Alexandria, VA 22314

CW3 Robert B. Murphy

CW3 Murphy was assigned to the Directorate of Training and Doctrine, U. S. Army Aviation Center, Ft. Rucker, AL, when he wrote this article. He is currently assigned to the U. S. Army Student Detachment, Montgomery, AL, and is attending Embry-Riddle Aeronautical University.



AN AIRCRAFT COCKPIT is not my idea of the ideal garden spot. That is why it sounded odd to me the first time I heard the expression, "cactus in the cockpit." Many years and hours of flying have passed since that crusty old civilian first introduced me to cacti in primary training, but his words have proven themselves many times over.

Raised on a farm, and thus instilled with a keen interest in gardening, I've tried to pass this along to students with whom I come in contact.

Before you go filling your mapcase with peat moss and your helmet with fertilizer, let me explain. Almost everyone has at some time been in contact with a cactus, resulting in a resolve to admire them from a distance. Therefore, wherever there's a cactus, the fingers are not likely to stray. So, a cactus makes a viable deterrent to mistakenly switched switches.

I planted my first cactus on the OH-23 Raven. Its exact position was at the OFF position of the magneto switch. As in the case with most novice gardeners, my first plant died—and during a high mag check so did the engine. Undaunted, I planted another in its place.

My next cactus was due to the inattention of a classmate. While waiting for the fog to burn off, we received a short class on the subject of tailrotor failures. With this in our minds, we headed to preflight for our first solo to a stagefield. I was still running up when the hapless comrade was preparing to hover out of the parking spot. (When soloing an OH-23, you sit astraddle the console with one tailrotor pedal on the right side and three pedals on the left.) Amidst a myriad of radio calls and checklists, he began his takeoff to a hover with his right foot on the right pedal and his left foot on the center pedal of the three on the left. As the helicopter got light on the skids, the nose began to turn right. He abruptly pulled up to a hover as he extended his left leg. To his surprise, both legs extended fully since he had one foot on the student's antitorque pedal and the other on the instructor pilot's (IPs). As I watched him spinning to the right, I heard him screaming on the tower frequency, "Antitorque! Antitorque!" Fortunately, he quieted long enough for an IP to give him some verbal instructions. I immediately planted a large cactus at those left instructor pilot station pedals.

Due to the similarity between the main fuel and hydraulic switches on the UH-1 Huey, it was necessary, from the first, to plant a cactus near the main fuel switch. After learning of a fatal accident caused by confusing these very switches, I knew I'd be wise to plant a second cactus just for good measure.

And if you need more justification for planting a second cactus in your garden just think back to your last standardization ride. When you entered your standard autorotation—along with establishing your airspeed and trim, checking gas producer and rotor revolutions per minute (rpm) and confirming your intended touchdown area—you felt around for the low rpm audio switch and, using a self-created system of Braille, located and turned it off. If you think you would never mistake the main fuel switch for the rpm switch, you need to review the statistics about inadvertent engine shutdowns. It is just about as common as "beeping" the rpm down when attempting to retract the searchlight on a night approach. (I've had a cactus planted there for years!)

Adding new or removing no longer needed cacti should be an ongoing project. Last week I was making a seat adjustment while at full operating rpm. As I raised the handle my glove caught on the collective and raised it several inches. The unsuspecting check pilot in the right seat regained his composure and mumbled something about thinking we had had a collective hard-up. As long as I fly Hueys, I'll keep a cactus growing at that seat adjustment lever.

Although it would vary from impossible to boring to tell you about all my cacti, the intent is to cause you to take inventory of your own garden. Don't hesitate to give your fellow aviators starts from your cactus garden. The best time to get them to take root and grow is during your safety meeting.